

# THE IRON AGE

New York, October 30, 1924

ESTABLISHED 1855

VOL. 114, No. 18

## Members Applaud Optimistic Views

American Iron and Steel Institute Pleased by President Gary's  
Address—Pittsburgh Plus, Business and Political  
Conditions Receive Attention

"GENTLEMEN, are any of you pessimists? Are you discouraged or down-hearted? Look ahead. Our lands, our climate, our wealth, our productive and transportation facilities, our increasing consuming desire and capacity, our educational advantages, our churches, our protective national constitution, our floating flag, our spirit of loyalty, all remain. Demagogues or anarchists or fakers cannot deprive us of these blessings. Where else on earth can be found another such nation? Let us be thankful, hopeful, confident and determined. Let us be loyal to our country, to all others who are interested in what we do or say, and to each other."

With the above ringing words, President Gary of the American Iron and Steel Institute closed his address at the opening session of the twenty-sixth general meeting, held at the Hotel Commodore last Friday.

"That is the best speech you ever made," said Charles M. Schwab, vice-president of the institute, as he was called to the chair, and the enthusiastic applause of the audience indicated that all were of one opinion. Judge Gary had devoted a considerable part of his address to giving the history of Pittsburgh plus and had concluded with a review of business conditions. He carefully avoided discussing partisan politics, but his description of the ideal President seemed to many of the 1200 present to be a rather accurate portrayal of the characteristics of the present occupant of the White House.

In reviewing business conditions, Judge Gary said:

### Business Conditions

"According to the newspaper reports, based on information gathered from usual sources, confirmed by much additional testimony, there has been a persistent, though somewhat irregular, growth in the volume of business generally throughout the United States since May, 1924. It has been considerably larger each succeeding month. There are no public reports showing the total production and shipment in this country of all classes of steel and iron for this period. The subsidiary companies of the corporation, which possess something less than one-half the capacity of all manufacturers in the United States, sold about 2000 tons per day more of steel in June than in May, about 6000 more tons per day in July

than in June, about 10,000 more tons per day in August than in July, about 6000 tons per day more in September than in August, and about 5000 tons per day more for the first 17 days of October than for the first 17 days of September. The shipments for the same period, on the average, exceeded sales because of the accumulated unfilled orders on the books which were placed prior to May.

"Partly due to spirited competition in selling and partly to other causes, including increased costs of production while various works were in less than full operation, and also including the disturbance and confusion created by the abandonment of the Pittsburgh plus system, so called, the net cash results during the last quarter have been somewhat less in proportion than would be indicated by the increase in tonnage alone. This undoubtedly will be shown by the accounts of the Steel Corporation when they are made up; and unfortunately it is more pronounced as to some of the independent manufacturers. As to the corporation, it is believed the profits for the last quarter were substantial notwithstanding the adverse influences adverted to.

"The future success of the iron and steel industry in this country is assured if the managers will keep their heads, and further if the approaching election results shall be satisfactory. As to the first proviso, we have the opportunity and the responsibility. As to the second, it is for the majority of the national electors to determine whether or not they desire continued prosperity. All of us, all the people of the United States, must together enjoy prosperity or suffer from adversity.

"It goes without saying that business conditions in this country during the next year and during the next four years depend largely upon the result of the election on Nov. 4 proximo. Every well-informed business man or woman knows that if the best men are elected there probably will be continued and increasing prosperity, and that if others less capable and less worthy are selected we may expect depression and disturbances in business, less production, more idleness, less comfort, more distress; a decided interruption to legitimate progress that will not be easily nor soon overcome.

"In this greatest of all nations, with largest opportunities for worthy achievement and human

happiness, there is possibility of suicidal action or neglect that will cause immeasurable loss and suffering to multitudes.

"But sentiments of self-protection will influence the large majority of voters to give careful thought to the best interests of the country and to themselves, and they will therefore wisely discriminate and decide. In this most important, if not critical, period in our history, they can be depended upon to act along the lines of prudence and safety. They will not take unnecessary chances of danger by adopting untried and uncertain theories or selecting officials whose compe-

attitude. We shall be friendly to them and, so far as proper and practicable, will be helpful, but we shall keep ourselves in the moral, financial, commercial and industrial condition necessary for the best service and most active assistance whenever justly called upon.

### The Banquet

At the banquet Friday evening, President Gary presided and announced that the guests of honor were three men prominently identified with the newspaper business, Frank A. Munsey, owner of

### The Ideal President as Described by Judge Gary

*"NO name for President is mentioned in these remarks; no political creed will be discussed; but some of the qualifications for the official leader of our great and beloved country may properly be referred to. First of all, he should be possessed of the highest moral principles. He should be absolutely impartial, disposed to favor no person or aggregation or interest to the undue prejudice of another. He should be modest, plain and simple, and still courageous, dignified and wise. He should ascertain the facts and patiently consider before he decides any question presented. He should truthfully and frankly inform the country concerning all public matters whenever it can be done without prejudice to governmental interests, relying upon an honest people for approval concerning the merit of his attitude. He should not hesitate to speak the truth, when it is necessary, nor to remain silent when no one could be injured thereby. He should be willing to lend his influence and devote his talents to legitimate business progress and general prosperity, and likewise to prevent and penalize corruption and wrong. He should endeavor to assist and to protect the poor, the weak and the suffering, and at the same time should be willing to help the rich, the strong and the happy when it is indisputably right to do so. He should practice and enforce strictest economy and husband all resources in governmental administration, but should not indulge in false economy. He should be willing properly to cooperate with and to assist foreign nations, entertaining always an intention of first considering and protecting the interests of his own country."*

tency is assured largely, if not alone, by their own professions and promises.

"Notwithstanding, as usual, every fourth year we are passing through a mud-slinging campaign, with its unfavorable effects, except there is an extraordinary quantity of mud this year, we shall find that an intelligent and fair-minded majority will be wise and courageous in their action. An overruling Providence, up to the limit of what this country deserves, will guide and direct the people. We will succeed in all laudable undertakings in spite of the unworthy efforts and words of unprincipled or incompetent individuals.

"Our Ship of State is too great, too fine, too solid, substantial and strong to be pronounced unseaworthy on the words of unscrupulous, unintelligent or inexperienced men, and then turned over to a board of underwriters. I am convinced the public has been right during the last few months in believing the election returns will be satisfactory, as shown by the steady and persistent increases in the volume of business. With such a result we may look forward through the autumn and succeeding months with hope and confidence. We shall not make ourselves a laughing stock to the onlookers of foreign countries, some of whom possibly watch and comment upon our

the New York Sun and other newspapers, Col. John B. McLean, Toronto, publisher of numerous newspapers in the Dominion, and Arthur Brisbane, writer for many newspapers in the United States.

Mr. Munsey, in opening his brief address, said he was glad to be the guest of "the aristocracy of industry," because he was always happy to mingle with men who work, and the work of the iron and steel industry tends to make men of stronger fiber than is possessed by many who are engaged in other lines of activity, such as the textile industry and the millinery business. He paid a tribute to the village blacksmith whom he knew as a boy, and said that the blacksmith is likely to be a pretty wise man. Referring to the present political campaign, he said that it meant more than any campaign in his day because a new political alignment is taking place. He estimated that the radical forces of the United States compose about 40 per cent of the voting strength and he believed that, if the radicals should get possession of the Democratic party with all of its strong voting force, the result would be disastrous to the country. He paid his respects to the "hard-boiled conservatives," who, he said, are more dangerous than the radicals. He described President Coolidge as the ablest adminis-



trator of the great office of President that the nation had ever had. "It is," he said, "the greatest piece of good luck that we have him. An accident of death gave us this extraordinary man for this extraordinary occasion."

Col. John B. McLean spoke very earnestly in commendation of the policy pursued by the United States Steel Corporation and other great companies in this country. He said that the wise policies which had been dictated by Judge Gary had caused the people of the country to feel kindly not only toward the Steel Corporation but also toward all steel companies and to business in general. He was sorry to say that in Canada the leadership of industry had not been so wise as in the United States and the result was that the tendency toward governmental control and ownership had extended to an alarming degree. He said that, although other countries were increasing their tariffs, Canada had reduced its tariff five times in five years and that

another reduction in rates soon would be made.

Arthur Brisbane captivated the large audience by his sallies of wit and words of wisdom. Speaking seriously at the close of his address, he said that there is only one problem in this country today and that is the problem of how to provide the proper kind of fighting air defense. He said that airplanes will be made of steel and that there will be hundreds of thousands of them in the world. France already has 4000, Japan has a very large number, and other nations are building them. He described the frightful destruction which might be caused by airplanes in future wars, and made an eloquent plea for upbuilding of its air defense by the United States.

President Gary, as usual, called upon Mr. Schwab to pronounce the "benediction," which he did in his inimitable humor and earnestness, telling one or two new stories and paying a tribute to Judge Gary.

## History of Pittsburgh Plus Given in Detail

### President Gary Tells of the Beginning of the Agitation and Traces Subsequent Events Up to the Decision of the Steel Corporation to Accept the Order

IN giving the history of Pittsburgh plus, Judge Gary referred to the "cease and desist order" of the Federal Trade Commission issued July 21, 1924, and said that after giving the whole subject careful consideration, the respondents concluded cheerfully to accept the decision and many of the leading independents, perhaps all of them, followed suit. Continuing Judge Gary said:

"Many of you were startled by the action of the commission and temporarily, at least, entertained feelings of disappointment and dissatisfaction. More than that, your business activities and progress have been interrupted, impeded and, in places almost demoralized. As yet, you have not been able to restore the natural trend of affairs. Sellers and purchasers alike have been groping for a course that would permit a basis for transactions which would furnish the stability and uniformity which every department of business effort desires and seeks. For the best success in industrial enterprise of any kind it is as necessary to have some standard to reckon from as it is to have a gold dollar basis to make comparison and computation. You are encountering and will continue to encounter difficulties. You may decide to appeal to the courts for remedy; but you are beseeched to give the matter most patient and painstaking thought before doing so.

"You have heard that much energy and considerable money have been expended in creating a sentiment that Pittsburgh plus is wrong in principle; and you have indulged a feeling that the proceedings before the commission were influenced by personal and selfish motives; but concerning this all of us should endeavor to consider both sides of the case before reaching a final decision."

Judge Gary then proceeded to a full account of the facts relating to the Pittsburgh plus agitation, referring first to the days when Philadelphia was the natural basing point followed in later years by Pittsburgh; to the new elements which from time to time appeared in the competitive conditions pertaining to the iron and steel industry; to complaints, increasing in volume, that purchasers in certain Middle Western localities were being discriminated against; and to the fact that in practice for several years Pittsburgh basing had, to a

certain extent, been disregarded by steel producers.

Judge Gary spoke in some detail of the correspondence which he had with John S. Miller, attorney of the Western Association of Rolled Steel Consumers and of the meeting in Washington, July 9, 1919, with Mr. Miller and members of the Federal Trade Commission. For the convenience of the members of the institute, Judge Gary had had printed for distribution the essential parts of the record of the meeting. This record entitled Exhibit "A" was published in THE IRON AGE of July 17, 1919. In conclusion Judge Gary said:

"It is perhaps sufficient to say that your president acted in behalf of the industry, as requested by the counsel of the larger interests. He said what seemed to him desirable in assisting to secure a decision by the Federal Trade Commission of all the questions pertaining to the Pittsburgh plus system, on the merits and as affecting every one and any one connected with the business.

"It was supposed by your president that the Federal Trade Commission would include as parties to the proceedings the whole iron and steel industry, and also all others, including various cities and towns, who might be affected by the result. The commission did not adhere to this supposed plan and perhaps might be justly criticized for this failure. However, in view of all that had taken place, the Steel Corporation

concluded it would not be justified in refusing to acquiesce in the findings and decree which were finally made.

"There would have been one of the biggest legal and official inquiries that has ever occupied the courts or governmental bodies if there had been included every interest affected, as was tentatively agreed to, and the whole subject had been referred to and finally adjudicated by the courts. As before suggested, any member desiring to appeal to the courts may still do so.

"It is believed the entire iron and steel industry will, within a reasonable time, voluntarily be operating on a basis conformable to the opinion rendered by the Federal Trade Commission, notwithstanding the United

*IF we are patient and reasonable we shall find, though with perhaps some work and cost, the industry, taken as a whole and including both producers and consumers, will not suffer materially by reason of the elimination of the Pittsburgh plus system. — President Gary's Address.*

(Continued on page 1183)

Overheard at the Institute Meeting: — Pittsburgh + = H —



F. L. ESTEP

## The Manufacture of Tin Plate in India

BY FRANK L. ESTEP

**F**RANK LESLIE ESTEP had his training in mechanical engineering at Ohio State University, graduating in 1898 as electrical engineer. After working as draftsman with Morgan Engineering Co., American Steel & Wire Co., Jones & Laughlin Steel Co. and Lorain Steel Co., he was made superintendent of Union branch, Bridgeport Brass Co., and later, successively, was assistant general superintendent Detroit Copper & Brass Rolling Mills and engineer of Rome Brass & Copper Co. He was chief draftsman of Cambria Steel Co., 1908-10; assistant chief engineer, Tennessee Coal, Iron & Railroad Co., 1910-12; became chief engineer, 1912-17; chief engineer Nova Scotia Steel & Coal Co., 1917-18; chief engineer and partner, Perin & Marshall, consulting engineers, New York, since 1918.

[Mr. Estep's paper deals fully and admirably with all the problems that were met in introducing the manufacture of tin plate into India. Owing to the length of the paper it is published in two instalments and each of these abridges somewhat the original text. In his introductory paragraphs the author tells of the conditions which brought the project into being. A market was needed for additional products of the Tata Iron & Steel Co. which had made large extensions to its plant at Jamshedpur (originally named Sakchi) on the main line of the Bengal-Nagpur Railroad between Calcutta and Bombay. Tin plate was being imported into India before the world war at the rate of about 50,000 tons a year. A large part of this was used by the Burma Oil Co. for containers for petrol and kerosene. The company had a plant at Budge-Budge, south of Calcutta and brought refined oil in tankers from Burma, putting it into cans for distribution over India. The Burma Oil Co. and the Tata company entered into an agreement in 1920 to finance the Tin Plate Co. of India, Ltd., which was to build a tin plate plant adjoining the Tata steel works and take sheet bars from the latter. The plan contemplated an initial plant producing 28,800 tons of black plate per year. This would take care of a large percentage of the Burma Oil Co.'s requirements.—EDITOR.]

### Climatic Conditions Required Special Design

It was early foreseen that, in order to operate successfully under the climatic conditions in India, the contemplated plant would have to be of special design and original in many respects. Perin & Marshall were entrusted with the design and construction of the plant as consulting engineers.

Generally speaking, the climate in this part of India is divided into three seasons; namely, the cold, the hot and the wet. The cold season extends from about Oct. 1, or Oct. 15, to about March 1, or March 15, approximately  $4\frac{1}{2}$  to  $5\frac{1}{2}$  months; the hot season, from about March 1, or March 15, to about June 15 to July 1, a period of three to four months; the wet season, from about June 15, or July 1, to about Oct. 1, or Oct. 15, approximately three to four months.

The rains stop early in October, the ground soon becomes dried of excess moisture, and the temperature gradually approaches an average minimum temperature of about 51 deg. Fahr. in the early part of January, and the working conditions during the cold months are ideal. The hot season comes on uniformly but rapidly and reaches its maximum, as a rule, late in April or early in May. At this time the atmosphere has become very dry, occasionally under 10 per cent moisture, and the maximum temperature will run from 105 deg. to 120 deg. Fahr. in the shade at about 3 o'clock in the afternoon.

The wet, or monsoon, period follows immediately after the hot season, and during the early stages the humidity becomes very high and has been continuously from 70 per cent to 95 per cent for two or three weeks. During the wet season it may rain almost every day, and in some seasons several times in a given day, the total rainfall over about 100 days being 30 to 40 in. After three or four weeks of these rains, the temperature drops and continues fairly even until into September, when it gradually decreases again with the slackening off of the rains.

The variations in temperature and humidity are shown on an accompanying chart.

The highest temperature ever recorded at the Tata Iron & Steel Co.'s plant was in April, 1920, when for twelve consecutive days the maximum temperature in the shade recorded on their instruments, ranged from 120 deg. to 127 deg. Fahr. The open-hearth department operated during this period. On account of the isolation of the tin plate plant, and the fact that it is near some low ridges thickly covered with jungle growth, the temperatures are about 4 deg. to 6 deg. lower, day or night, than at the Tata plant.

The accompanying general plan of the works shows in full lines the plant as finally built, and in dotted lines the extension to twice the present.

### Special Construction to Secure Operation in Hot Months

It was known by the engineers, from experience with the Tata plant, that to keep the inside of the buildings as cool as possible in the hot months, they must



View of Buildings of Tin Plate Plant, Looking East



be extremely high and of large volume, with huge monitors, roofs with wide overhanging eaves, and the sides made with long louver construction and left wide open where possible for 10 to 12 ft. from the ground level. It was also necessary that the buildings be spread apart so that they could be exposed on four sides for air. The main buildings occupy a rectangular plot 801 ft. by 1143 ft., and the same area exactly will accommodate a plant of twice the present capacity. All main buildings are 35 ft. to the roof truss, except the furnace building, hot mill building proper, shear building, and annealing furnace building, all of which are 45 ft. to the roof.

These buildings, therefore, are larger in volume than buildings in tin plate plants in the United States, and the furnace, hot mill and shear buildings, in addition to their extreme height, were stretched in length to give a wide spacing of mills. The hot mill building proper, covering two double mills per drive and six mills total, gives an average floor area per double mill of 90 ft. by 69 ft. 6 in., or 6255 sq. ft. per mill. In section the hot mill building proper has 3127.5 sq. ft. to the bottom chord of roof truss, 505.5 sq. ft. under the main roof, and 117.2 sq. ft. under the monitor, a total cross sectional area of 3750 sq. ft. This is, therefore, a total volume of 337,500 cu. ft. per double mill. These floor areas and volumes are to be compared with approximately 4400 sq. ft. and 150,000 cu. ft. per double mill in the United States. In other words, the floor area of the Indian hot mill is 42 per cent, and the volume is 125 per cent in excess of the American.

This also means that, assuming the tonnage heated and rolled in India to be only 75 per cent of that for the same type of double mill in the United States, the floor area is about 90 per cent, and the volume about 200 per cent in excess of the American, per unit of heat turned loose in the atmosphere at and about the mills.

#### Other Features That Minimize Heat Effects

It may be well to describe at this point the other special provisions in the hot mill proper, to insure operation regardless of temperature.

With the furnace building on the one side and the shear building on the other side of the hot mill building proper, both being 45 ft. to the roof chord, with the furnace building wide open 12 ft. from the ground, with large louveres above, and with the shear building inclosed with large louveres to within 12 ft. of the ground and inclosed from this point to the ground with small louveres, there is always a chance for external air to get into the hot mills. In addition to this, there is a large space between and above each furnace, allowing outside air to enter from the south through the furnace building, between and over the furnaces into the hot mill building proper, and carry the heat into the upper part of the building and eject it through the wide open monitor. If the wind is from the north, the heat is carried up into the furnace building, and out through its monitor.

Each pair and each double sheet furnace was completely hooded over, and each hood attached to a separate stack, larger in diameter and surrounding the draft stack, and extended several feet through the roof. Practically all the radiated heat from the furnaces, and smoke, flame and heat coming out from the doors when open, and much of the smoke and heat that arises from the stokers at the back of the furnaces, are immediately carried by these hoods and stacks out of the building through the roof and discharged into the outside atmosphere. All furnaces have water-cooled fronts.

Between the units of two double mills there is installed a fan of 36,000 cu. ft. per min. capacity delivering 18,000 cu. ft. to the men on each mill through underground ducts and 11 elbows. There is delivered approximately three cubic feet of air per min. per sq. ft. of total floor area, or over 9 cu. ft. of air per minute per sq. ft. of operating area. This means further over 400 cu. ft. of air per min. per man.

Not being sure whether the men on the hot mills could stand up to their work better with a given quantity of hot dry air, or with the same quantity of air at a lower temperature and higher humidity, each of the fans was installed with an air washer on its suc-

tion. By this means any proportion of the total amount of air going to the men, from zero to 100 per cent, can be put through a spray and its temperature reduced. This was a very wise provision, and it may be positively said that this feature was practically the salvation of the hot mill, so far as its continuous operation was concerned during the first summer period of 1923.

#### Temperature and Humidity Conditions

The air washer was started March 1, 1923, and comparative readings taken and recorded daily of the temperature and humidity of the outside air in the shade at about 3 o'clock each afternoon, and the temperature and humidity of the air discharged at the various elbows in the hot mill. In March the average maximum temperature was reduced from 91.9 deg. to 77.3 deg., and the corresponding humidity raised from 28.6 per cent to 41.2 per cent. In April the average maximum temperature was reduced from 104 deg. to 87.1 deg., and humidity raised from 30 per cent to 50.2 per cent. One afternoon in late April, when the outside temperature in the shade was 109 deg., and the humidity less than 20 per cent, the readings showed 80 deg. at the elbows, a reduction of 29 deg. In May, the average maximum temperature was reduced from 103.3 deg. to 87.8 deg., and the humidity raised from 32.3 per cent to 52.8 per cent.

In June, the first 23 days of which were hot and dry, and the last seven wet and cooler, the average maximum temperature was reduced from 100 deg. to 86.2 deg., and the humidity raised from 46 per cent to 67 per cent. It is worth while to note here that during July and August, the two worst of the monsoon months, the hot mill men preferred to keep the air washer on, and did not shut it down. This is illustrated by the following figures. In July the average maximum temperature was reduced from 90 deg. to 86.1 deg., and the corresponding humidity raised from 60.9 per cent to 72.3 per cent. In August the average maximum temperature was reduced from 87.8 deg. to 86 deg., and the humidity raised from 79.3 per cent to 83.7 per cent.

#### Water Cooled Floor Plates

Special provision was also made by installing an exceptionally large area of water-cooled floor plates per mill. There are 1220 sq. ft. per double mill, 270 on the back side, and 950 on the front side of each mill. These floor plates are cast iron, and although not as efficient in cooling as the welded water box plates, they have answered the purpose admirably. During the hottest periods in 1923, although the incoming water reached a temperature as high as 100 deg. the discharge temperature of the water at the discharge weirs never exceeded 105 deg.

Attention is called to the fact that this very large area of water-cooled plates was not only beneficial to the men, so far as their being able to work on them was concerned, but the large area outside of the particular spots with which the metal came in contact, and upon which the men worked, held down the temperature at all times and forced the heat from about the men up into the building. That this statement is true and that the principle involved is applicable anywhere, is borne out by the fact that all grease fumes arising from the necks or steam from the body of the rolls of these mills in operation on these exceedingly hot days, rose straight up and quickly from about the mill. There was no cloud or haze or smudge hanging about the mills or in the building.

The above described features combined—volume of building, hooded and water-cooled furnaces, cool air in great quantities, and the excessive area of water-cooled floors—made it possible to maintain operations at a very decent efficiency during the first summer, irrespective of temperature or humidity, both of which are far more severe than at any other tin plate plant in the world today.

#### Electrically Driven Mills

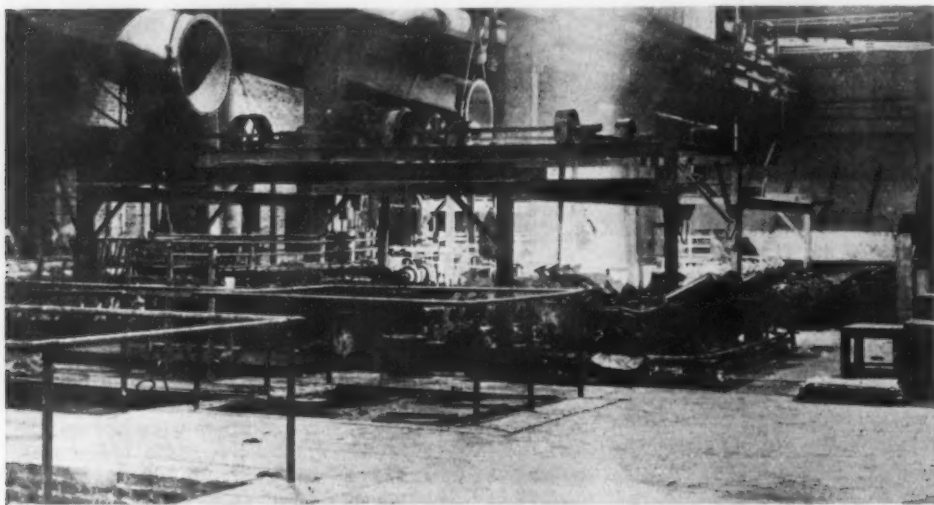
Electrical power, three phase 50 cycles, is supplied from the Tata company's station, about 3½ miles away, over a loop line, at approximately 3200 volts, generator switchboard, which drops to 2800 to 3000

volts at the tin plate plant. The incoming lines pass through an outside meter house, owned and controlled by Tata, containing cut-out switches, lightning arresters and recording integrating watt meter, and pass into the power house.

The power house contains a 1000 kva., 750 kw. 250-volt d.c. motor generator and the motor driving the cold

age for lighting, while a circuit at 3000 volts leaving the tin plate power house switchboard carries current to Golmuri town for lights and fans.

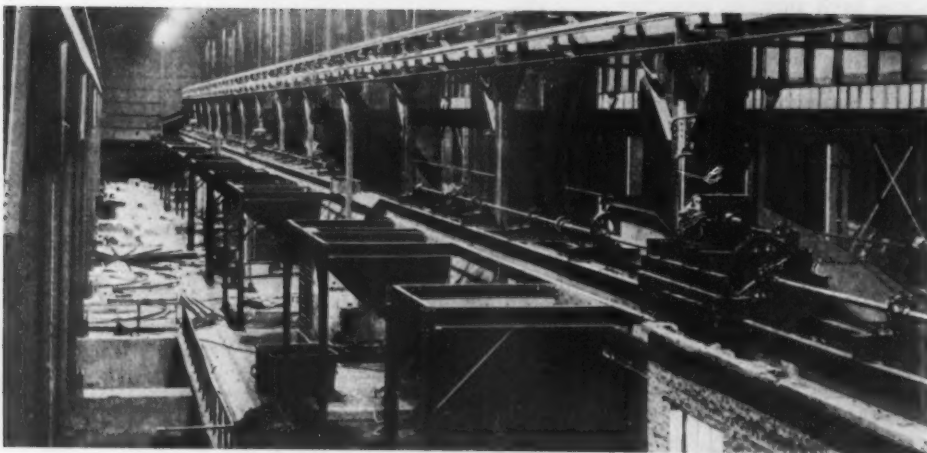
All electrical equipment, except some miscellaneous material and small motors, are General Electric Co. make, shipped from the United States, and were on the ground quite some time before needed. Nearly every



Thomas & Davies  
Automatic Feeding,  
Pickling, Tinning  
and Finishing  
Machines



Shear Building



Hot Mill Furnace  
Building

rolls, together with the gear reducing set and gear train. There is also a motor driven compressor and a direct connected oil engine driven 12 kw. d.c. generator unit for emergency use to generate direct current enough to throw the main oil switches, when and if the power goes off the main line and shuts the plant down.

All a.c. auxiliary power apparatus is 440 volt, all cranes are d.c. and many of the individual machine tools, stoker drives, blowers and all tinning machines are driven with variable speed d.c. motors. Transformers are located at various points for low tension volt-

age for lighting, while a circuit at 3000 volts leaving the tin plate power house switchboard carries current to Golmuri town for lights and fans.

#### Rolling Mill Equipment

The hot mill department consists of three units of two double mills each, one double mill on either side of the motor. The mills were furnished by the Mackintosh-Hemphill Co. and each unit is driven by 1000 hp. American or about 850 hp. Indian rating, 3000 volt,



300 r.p.m. motor through a reducing gear set with very heavy flywheels, furnished by the Woodard Machine Co. The rolls are 28 in. diameter and run at 33.2 r.p.m. Each motor has its own control room which is located directly opposite the motor itself, in a brick house in the furnace building. Each motor and control room is provided with underground air ducts for cooling from the same air system which supplies the men.

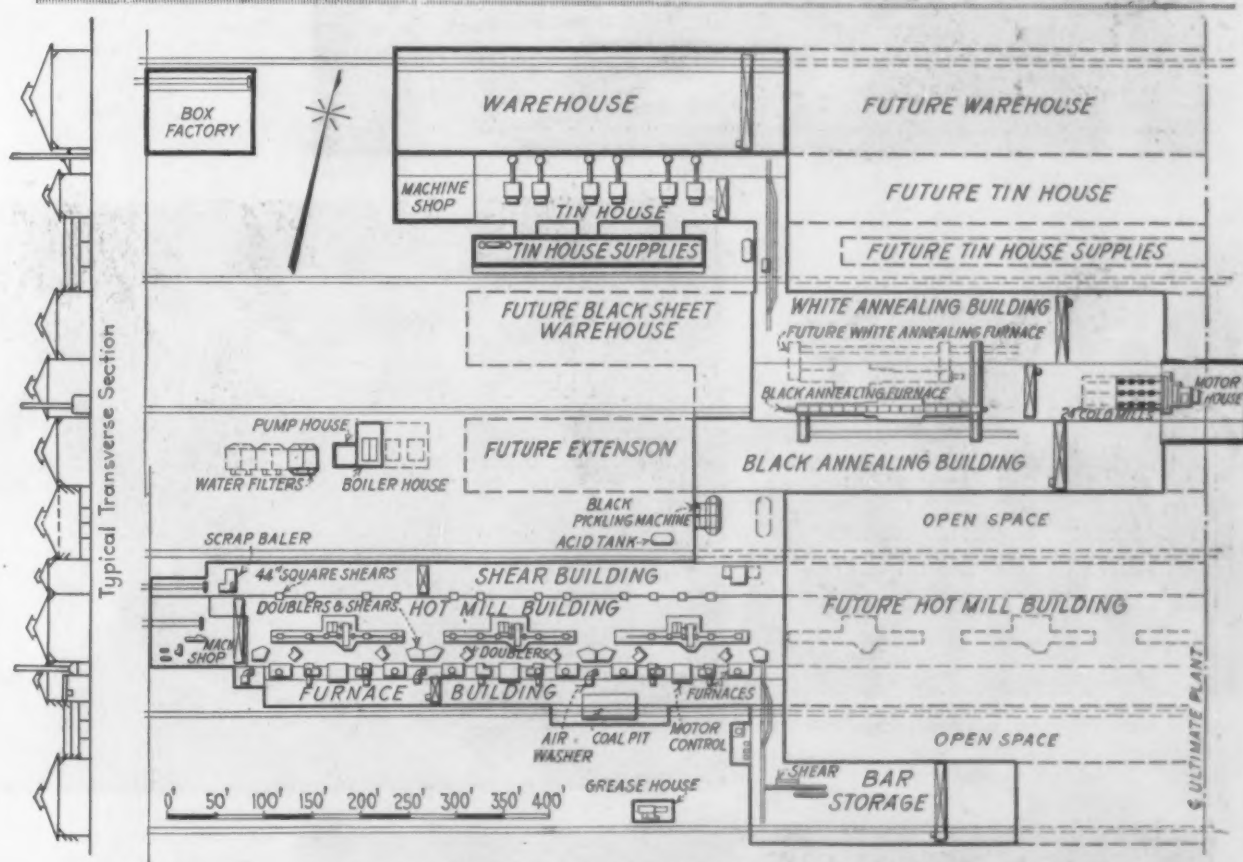
The cold roll department consists of four sets of rolls, three in tandem, also furnished by Mackintosh-Hemphill Co., the roughing train driven at 48 r.p.m., the intermediate at 50 r.p.m. and the finishing train at 52.6 r.p.m. from a 750-hp., 3000-volt, 500-r.p.m. wound rotor induction motor through a gear reducing set and a train of five cut gears manufactured by the Woodard Machine Co. Foundations and bed plates have already been installed and the motor is of sufficient capacity to drive a total of seven sets of cold rolls in the future.

the hot months, and the output would have dragged materially. Besides, it would have entailed the importation of at least twice the total number of Europeans for the hot mill proper, and the operating cost would have become prohibitive.

The black pickling machine is of the Grey type, built by Taylor & Sons, Ltd., of Briton Ferry, England, and is the latest design of this machine.

Cast iron annealing bottoms and cast iron false bottoms were made locally in India to save freight, while the hammer welded annealing box covers were manufactured by the Blaw-Knox Co.

The white pickling and tinning is done on six Thomas-Davies combination white pickling, tinning and cleaning machines, manufactured in South Wales. These are installed in a building designed especially for them and erected rights and lefts with coal firing pits common to two machines, and so arranged that each



Tin Plate Co. of India; Tin Plate Mill, General Arrangement

All rolls, hot and cold, were furnished by the Pittsburgh Roll Corporation.

All shears and roll lathes were furnished by the United Engineering & Foundry Co.; the pair furnaces, sheet furnaces, continuous annealing furnace and furnace cars by the George J. Hagan Co. The pair furnace pushers are operated hydraulically, as is also the Logeman scrap bundler.

Nine cranes total cover all operating departments, with the exception of the black pickling, and range in capacity from 5 to 15 tons. They were furnished by the Alliance Machine Co. All ratings are in gross tons.

#### Mechanical Doublers Necessary

The hot mills were equipped with six Steele mechanical doublers for the roughers, and also six with shears for the finishers. These were furnished by the American Sheet & Tin Plate Co. Experience has proved that, without the mechanical means of doubling, it would have been impossible to operate successfully during the hot months on the two-roll, three-part system in India. The physical effort of hand doubling would undoubtedly have proved too great for any Indian, Europeans would have been unable to stand up under this work during

machine discharges its tinned product directly into the warehouse for inspection. Each machine is completely hooded and connected to a separate stack which surrounds the tin pot stack. The draft was insufficient to pull out the heavy fumes and vapors, and suction fans were later on installed with each hood. The hoods can be quickly removed by crane, to permit stripping the pots during repairs.

On account of the scarcity of water during certain months, all uncontaminated water from the plant is conserved and collected in a large reservoir, from which it can be picked up by pumps and returned into the system, and the water piping is so arranged that this returned water can be used in places where it does not need filtering.

For drinking purposes about the plant, for the Europeans in Golmuri town, and also for water for the manufacture of ice and bottled soda, it was necessary to install, in connection with the sand filter, a chlorine system for purifying the water. For the equalization of water pressure and as a short period supply in case of emergency, a water tower was erected on the space adjacent to the furnace building. On top of this there is another tank for the storage of filtered and chlor-

ined water as a supply to Golmuri town, it being at sufficient elevation to send water by gravity to individual storage tanks located on the top of each house in Golmuri.

All the main buildings, forming the plant proper, are inclosed with a brick wall, inside of which are also located a timekeeping office and a general works office,

was found necessary to erect a fair sized emergency hospital, medical supply room and attending doctor's living quarters. Also, in the same general direction from the plant but farther away, there was erected a very fine general office, where all accounting, etc., is done.

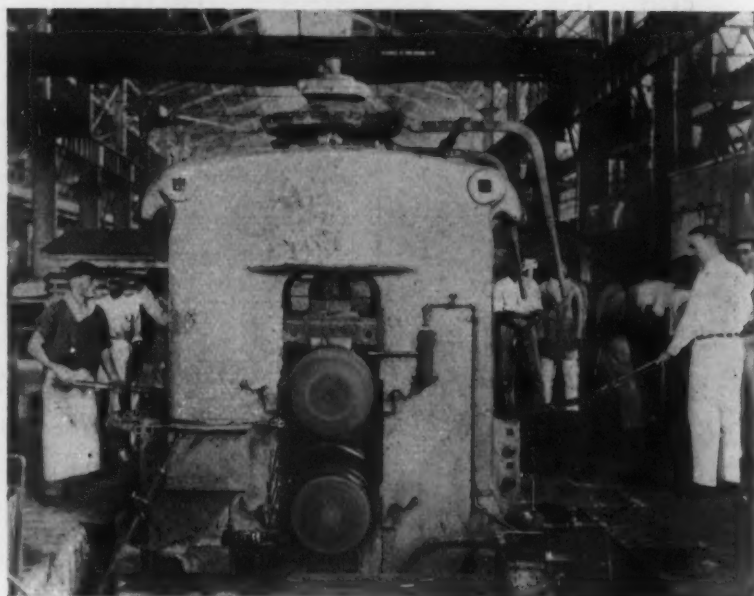
Since the entire section of the territory where the



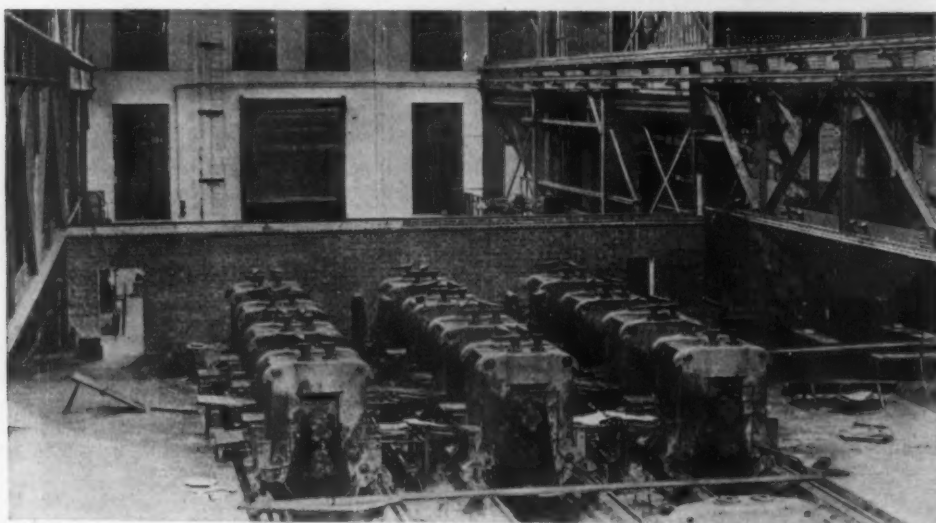
Hot Mill Building, Showing the Three Double Mill Units, Sheet and Pair Furnaces and Motor Control House



Left to Right: Samson, Leyshon, Estep, Bell



Starting of Sixth and Last Hot Mill, Dec. 12, 1923



Cold Roll Department

the latter being located between the shear building and tin house supply building. Outside of the wall at the southwest corner there is an ice making plant of two tons per day capacity and a soda water manufacturing and filling plant. South of and opposite the southeast corner of the wall, on the entrance side of the plant, it

plant was built was originally nothing but a jungle, and since it was known that about 100 Europeans would have to be imported into India for the operation of this plant, it was found necessary to put up a complete European industrial city, and three or four new and modern Indian villages, for the housing of the

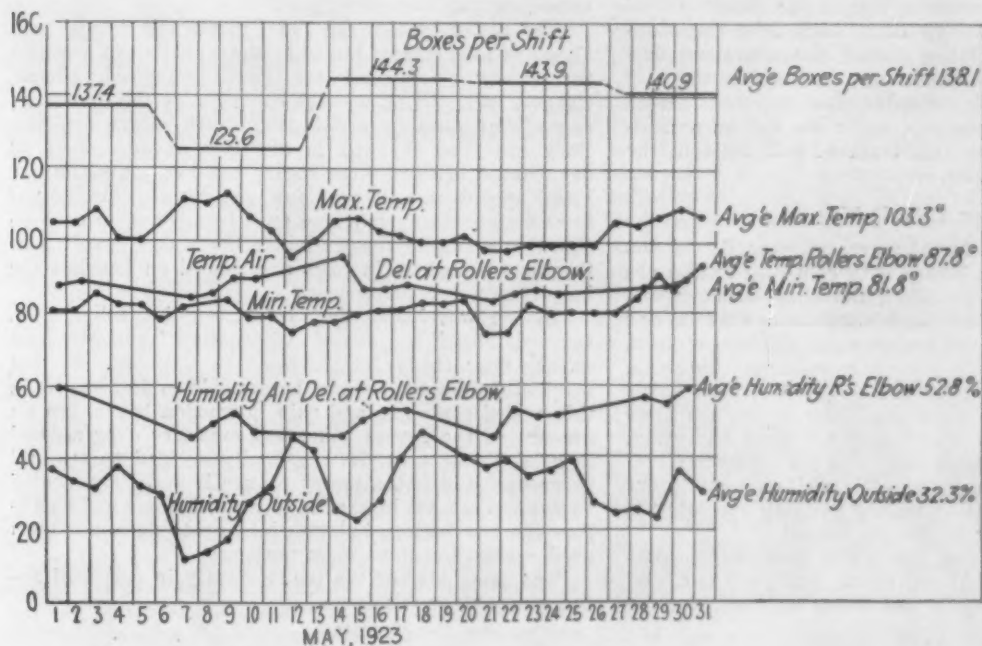


higher class and better paid Indian and Eurasian labor.

The European town is on a hill higher than the works, located about one mile due south, and embraces a plot of ground of about 50 acres. There were built one agent's bungalow, one works manager's bungalow, 49 workmen's bungalows, and a hotel. Some of the workmen's bungalows have two bedrooms and two living rooms, some have two bedrooms and one living room, and a few have one bedroom and one living room. Every room has one or two ceiling fans, also each

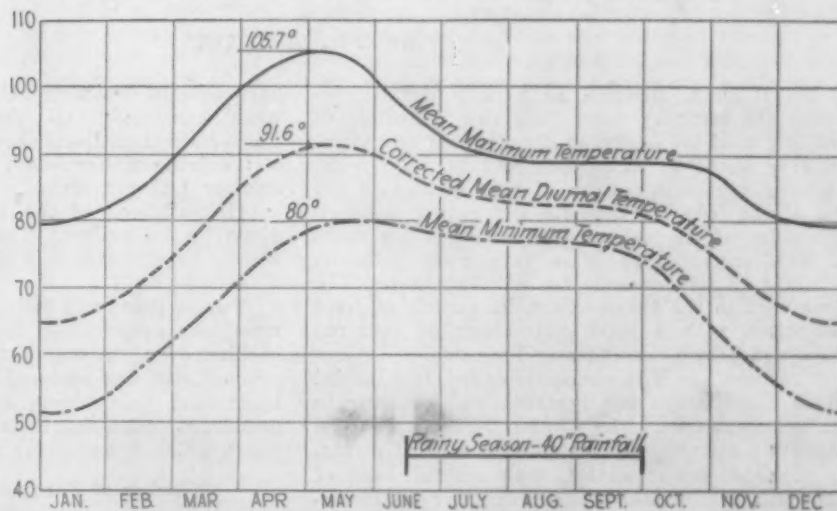
ing. Here the bar carriers are placed by a five-ton crane back of the six continuous pair furnaces.

Coal is emptied into a large coal pocket from the track outside of the furnace building, and a grab bucket on the furnace building crane delivers coal into hoppers which will hold about one and a half tons each and feed the individual stokers by gravity. Ashes are collected in cars on an industrial track, which passes out across the yard through the inclosure wall, and are dumped in the neighborhood of the return water pond.



Hot Mill Log: Production, Temperatures, Humidity. Note: Humidity and delivered temperatures taken at 8 p. m. daily; maximum and minimum temperatures taken in shade by Government standard method

Temperature Ranges at Chaibasa, 150 Miles West of Calcutta and 733 Ft. Above Sea Level; Barometer, 29.1 In. Note: This is the nearest station to Jamshedpur for weather reports. Weather data during 1889 to 1906



veranda. These fans will average about seven per bungalow and are 52 in. in diameter, with variable speed control. They are absolutely necessary for the comfort of men living in bungalows in the hot dry months, and all current for lighting and fans is individually metered to each bungalow, and the men pay for current used at cost to the company.

#### Arrangement for Handling Materials

The movement of materials through the plant during the process of manufacture, from bars to finished tin plate, is as follows:

Bars brought in from the Tata company's plant are unloaded by a spreader beam crane in the bar storage building, placed when wanted at the bar shear, where they are cut to the desired lengths. Cut bars are loaded on bar carriers, picked up with the crane, stacked on a truck and weighed as they pass into the furnace build-

ing. Scrap from the mechanical doubler shears, as well as all of the scrap from the squaring shears, is collected in large steel buckets, carried with the mill crane or the shear building crane to a point opposite the scrap baling press, which is located in an extension to the shear building. A three-ton monorail Shepard hoist covers the baling press pocket, and extends out of the building far enough to cover three railroad cars.

Black plate is opened adjacent to the shears, placed on special carriers and conveyed by overhead crane to a point opposite the black pickling building, and here placed upon small hand trucks. These trucks pass over a scale, and all plate leaving the opening floor is weighed as it enters the black pickling department.

In operation of the black pickling machine the crates make an elliptical movement into one acid and two water tubs, and at the discharge end of the circuit the crates are unloaded and the plates passed over the in-

spection benches, which are located directly underneath the crane runway, and then stacked without further handling onto the annealing bottoms in the black annealing building. The plates are placed on false bottoms which set on the annealing bottom proper, and their use has proved of very great benefit.

After the plates are flushed with a hose and the bottoms covered and sealed, they are picked up with a 15-ton crane and placed on a furnace car, which in turn sits on a transfer car, at the entering end of the black annealing furnace. After passing through the furnace for black annealing, the furnace cars are discharged on another transfer car at the other end of the furnace, which brings them back into the black annealing building. When cooled, the annealing bottoms are unloaded opposite and in front of the cold rolls, and as the plates are cold rolled they pass across the furnace building and are again stacked on annealing boxes back of the last train of cold rolls in the white annealing building.

#### After Cold Rolling

At this time and for the present capacity of the plant, the boxes when loaded with cold rolled plate are transferred back into the black annealing building, and are passed through the same continuous furnace for white annealing, but the transfer car discharges them this time into the white annealing building. Later on, when a white annealing furnace is installed, these boxes will pass through for white annealing in just the same manner as is done in the furnace for black annealing, except that the movement will be in the opposite direction, thus bringing the plates after white annealing out at the end of the white annealing building opposite the cross building leading to the tin house.

When properly cooled the white annealed bottoms are picked up with a 15-ton crane, put on a car, and after passing over a scale and being weighed, are de-

livered underneath a 10-ton crane in the tin house. This crane picks up each false bottom with its load of white plate, or the bottom with the entire load, and sets it down in front of either of the tinning machines. Here the plates are removed from the piles, are sanded and placed in the feeding pickets of the tinning machines.

From this point until they are picked up in the warehouse and placed on the inspection benches, the plates are not touched or handled, and, as compared with best practice in the United States, approximately five handlings total have been eliminated between white annealing and inspection.

The plates go through the Thomas and Davies machines in four steams for wide plates and eight streams for narrow plates, and are pickled, swilled, tinned, cleaned, collected on a cross conveyor at the discharge end of the machine, and brushed with rotary brushes. They are then changed in direction of movement 90 deg., again brushed with rotary brushes (this time at right angles to the previous brushing), discharged from this brushing machine on a belt conveyor and go through a slot in the wall into the warehouse, where they are picked up in piles and placed on benches for inspection.

In the warehouse the plates are inspected, slit, counted, boxed and sealed in "wasters," and are held on the floor ready for shipment to Calcutta. It was originally thought it might be possible to do away with this sealed container and ship in wooden boxes, but on account of the severe rains and moisture over several months of the year, it was finally decided to seal all shipments and not attempt to use boxes. The sealed containers are not incased in any wooden box and therefore the box factory building has, up to date, not been used, except for store room purposes.

[The remainder of the paper, nearly in full, will appear in next week's issue.]

## Blast Furnace Practice in Birmingham District

BY R. H. LEDBETTER\*

THE Birmingham District, as usually defined, includes the territory furnishing raw materials to the iron and steel industries of Birmingham and vicinity, an area about 60 miles long and 30 miles wide. The striking economic feature of this district is the location of the iron ore deposits and coking coals on opposite sides of the valley, approximately six miles apart, with outcroppings of a very good dolomite, which fulfills all requirements for a fluxing stone. The iron ores used in the furnaces consist largely of hard red hematites, with a small percentage of soft red hematites and brown hematites or limonites.

The "red ore," as it is commonly called, is a bedded deposit of fossiliferous red hematite which occurs in the Clinton formation. The Clinton formation of the Red Mountain district includes about 200 ft. of strata, mainly sandstones and shales, with several beds of iron ore, only two of which are of commercial importance, the "Big Seam" and the "Irondale Seam." The former supplies most of the tonnage of the district.

The following are typical analyses of Big Seam ore, which, as stated, constitutes the principal supply for all the furnaces:

	Ishkooda	Wenonah	Muscoda
Moisture .....	1.00	1.00	1.00
Iron (Fe) .....	36.82	37.10	35.28
Silica (SiO <sub>2</sub> ) .....	17.90	13.18	10.38
Alumina (Al <sub>2</sub> O <sub>3</sub> ) .....	3.03	3.05	3.12
Lime (CaO) .....	13.67	16.02	19.35
Manganese (Mn) .....	0.17	0.16	0.16
Phosphorus (P) .....	0.37	0.36	0.30

To the northeast of Birmingham, a limited tonnage of ore is being mined from the Irondale seam. A typical analysis of this ore shows: Iron 33.67, silica 22.54, alumina 5.00, lime 12.89 per cent.

The coking coals of the Birmingham District are limited to the Warrior Field, which lies on the northwest side of the district. To produce a good blast fur-

nace coke of desirable ash content, it is necessary to wash practically all the coals. A representative washed Pratt coal will show about the following analysis: Volatile matter 30.80, fixed carbon 63.90, ash 5.30, sulphur 1.25 per cent.

[Descriptions of the raw materials available are given by the author. These have been dealt with in society papers and in articles that have appeared in THE IRON AGE.]

Twelve years ago fully 90 per cent of all blast furnace coke produced in the district was made in the beehive oven. Since that time the regenerative by-product oven has replaced the wasteful beehive. Three by-product coke plants are today operated by iron producers, and a fourth is coking coal for a 3-furnace plant, which has recently abandoned its beehive ovens.

#### Number of Furnaces and Their Features

There are in the district 24 operative blast furnaces, with a total annual capacity of 2,735,000 gross tons of iron. These vary in size from the smallest of approximately 10,000 cu. ft. in content to the largest of 31,235 cu. ft., the latter being the cubical content of the recently rebuilt No. 1 Ensley stack of the Tennessee Coal, Iron & Railroad Co.

There is nothing unusual about the construction of any of the Southern blast furnaces. On account of the low metallic content of the ore charge, they produce more than 2300 lb. of slag for each gross ton of iron. This excessively high slag volume is very destructive to hearth linings, and as a result frequent iron and cinder breakouts have occurred, a number of which have been serious. However, in recent years this has been largely overcome by stronger jackets, better protected and cooled. At a number of the furnaces, particularly those of the Tennessee Coal, Iron & Railroad Co., the hearth well has been done away with.

The tuyere zone is protected with cast iron or steel

\*Superintendent of Blast Furnaces, Tennessee Coal, Iron & Railroad Company, Birmingham, Ala.



segments completely covering this area. On account of the cutting action of the slag, no furnaces are constructed with exposed brick in this section.

There are two types of bosh construction followed: One is the usual block bosh, consisting of from four to eight rows of copper cooling plates inserted into cast iron housings, the other of one to three rows of copper plates immediately above the tuyere jackets, the remaining portion of the bosh being housed with steel plate one-half to one inch thick, which is either cooled with a series of water sprays or by cast iron inside cooling plates extending to the furnace mantle. With one or two exceptions, the larger furnaces have adopted the former type. The mantles are constructed of either heavy reinforced cast iron sections, or fabricated I beams or channels, or both. There are no so-called "thin lined" furnaces in the district.

On account of the excessive abrasive action of the Southern furnace charge, attributable largely to the refractory hard red ores, the top brick soon suffer unless protected. A number of types of stock line protectors are in service. The one generally used, and probably best adapted to local conditions, consists of a heavy cylindrical cast iron ring, 3 in. thick of a height of 7 ft., reinforced with  $\frac{3}{4}$ -in. plate on the outside. They are either supported by brackets fastened to the shell or rods from the tunnel ring or top cone.

Nine of the 24 furnaces are hand-filled, and are provided only with a single large bell without gas seal. The size of the bell varies with the diameter at the stock line, the usual practice being to make the bell of about 4 ft. smaller diameter than the furnace at the stock line. The angle of this bell is usually 45 deg. The cubical capacity of the receiving hoppers are designed to hold one complete charge of from 16,000 to 22,000 lb. of ore, coke and stone.

Of the 15 mechanically-filled furnaces, 13 are equipped either with the Brown or McKee type top modified to suit local conditions. The top constructed by the Tennessee Coal, Iron & Railroad Company and in use on all of its six skip-filled furnaces has given excellent results. Nos. 2 and 3 Ensley furnaces have each produced more than 1,000,000 tons of iron on a lining. No. 2 Ensley furnace, now in blast, has produced on its present campaign 960,000 tons, and promises to cross the million ton mark before the first of the coming year. No. 3 Ensley, at present in blast and in good condition, has made more than 750,000 tons on its lining. [Some of the details of this furnace construction are given.]

Many types of stoves are in use, the 2-pass, the 3-pass, and the 4-pass all being in service. The majority of the older hand-filled furnaces are equipped with the 4-pass stove of the Whitwell type. The 12 stoves of the Republic Iron & Steel Co. at Thomas are 3-pass central combustion chamber of the Massick & Croke design. Twenty of the 27 stoves of the Ensley group, Tennessee Coal, Iron & Railroad Co., are 3-pass central combustion chamber designed by McClure. The remaining seven are 2-pass, four of which are central combustion chamber, and three, side combustion chamber.

The blast temperatures maintained in this district are probably higher than in other iron-producing districts of the country. At the different plants, it ranges from 1100 to 1400 deg. The records covering a period of more than a year show an average blast temperature of 1170 deg. for the group of Ensley stacks operating on low silicon iron.

No gas blowing engines are used. Twenty-one of the 24 furnaces are blown with reciprocating engines, principally of the vertical long cross-head type. Three furnaces of the Ensley group are supplied with blast from two turbo blowers operating on exhaust steam from reciprocating engines, and one blower driven by high pressure steam, superheated.

#### Cleaning the Gas

In recent years more attention has been paid to the cleaning of blast furnace gas. The demand for higher blast temperatures, greater wind volumes and finer crushing of ores has resulted in dirtier gas. In addition to the original dust catchers, a number of the furnaces have gone further into the cleaning of their gas, particularly that portion which is used in the

stoves. At Thomas, the Republic company has, in addition to the primary dust catcher, a Mullen washer for each furnace and an individual washer of the Stewart design for each stove, from which very good results are obtained. At Ensley furnaces no wet cleaning has been applied.

The flue dust production of the furnaces of the district will average approximately 135 lb. per ton of iron. A month's average analysis of the dust produced by the Ensley group of furnaces shows: iron 26.02, silica 12.21, alumina 2.94, lime 12.16, carbon 23.59 per cent. The low metallic iron and high carbon content of the dust prohibits sintering by any of the present known commercial systems. There is, however, one sintering plant operating in the State, at which plant a mixture of flue dust and iron pyrites is sintered.

Fifteen of the 24 furnaces normally produce iron for the market, all of which is cast in sand beds. A large percentage of this tonnage is disposed of to nearby plants and used in the production of high pressure water pipe, sanitary pipe and fittings, stoves and miscellaneous castings. Eight of the nine remaining furnaces produce basic or low silicon iron, which is handled as hot metal directly to steel works for conversion into open-hearth steel. One furnace is usually operated on ferromanganese, low phosphorus or special iron to fulfill the needs of the steel works.

#### Bessemer Iron from Scrap

There are no known ores in the Birmingham district available in commercial quantities for the manufacture of Bessemer pig iron. The average phosphorus content of the red hematites, which constitute 90 per cent of the iron ore supply, shows 0.30 per cent, and since it requires approximately 2.7 tons of ore for one ton of pig iron, the resultant phosphorus content in the iron is about 0.80 per cent. For many years, Bessemer and low phosphorus iron were purchased from other districts for the manufacture of ingot molds and special castings.

A few years since a method was developed for the manufacture of low phosphorus iron without the use of iron ore. This is done by charging into the furnace steel scrap, coke, gravel, dolomite and a small quantity of manganese ore. The steel scrap of the charge consists mainly of rail ends and bloom crops, with a small percentage of miscellaneous plate and rod scrap. The following is a typical furnace charge when operating on this iron: steel, 12,600 lb., coke 5700 lb., dolomite 4600 lb., river gravel 1800 lb. The gravel is added to furnish the acid to permit the use of additional dolomite to increase the slag volume for the absorption of sulphur in the coke.

A very high-grade Bessemer iron is produced, which cannot be distinguished from that produced from iron ore. On a recent campaign of No. 2 Bessemer furnace of the Tennessee company 12,000 tons were produced, which showed an average analysis of: silicon 1.98, sulphur 0.028, phosphorus 0.076, manganese 0.82 per cent. Total carbon content will average about 4.25 per cent. The quantity of slag produced per ton of iron, of course, can be governed. After experimenting, it has been found that with ordinary steel scrap of about 0.04 sulphur and coke 1.10 per cent S, 800 lb. of slag per ton should be made. This keeps the sulphur well below the saturation point of the slags and permits the control of the sulphur in the iron. An average slag analysis for this campaign shows: iron oxide (FeO) 0.71, silica (SiO<sub>2</sub>) 37.07, alumina (Al<sub>2</sub>O<sub>3</sub>) 7.07, lime (CaO) 35.47, magnesia (MgO) 17.82, sulphur (S) 1.39 per cent.

This operation should not be confused with that of the cupola. Besides melting the scrap and slag forming constituents, it returns to the metal all that was removed in the converter and the open-hearth except the phosphorus.

No. 1 furnace at Ensley, the largest in the South, with a cubical capacity of 31,235 cu. ft., consumed in August, just past, 71,712 gross tons of raw material, yielding 17,602 tons of iron, with a coke consumption of 2515 lb. per ton of product. During this month the furnace was blown by turbo blower, delivering an average of 60,830 cu. ft. of air per min. with an average blast pressure of 19 lb.

No. 3 furnace of the Ensley group, typical of the

larger furnaces in the district, is of the following dimensions: hearth 18 ft. 6 in., bosh 23 ft., bosh height 12 ft. 9 in., bosh angle 80 deg., stock line 16 ft., total cubical contents 25,435 cu. ft. This stack is equipped with five 3-pass central combustion chamber stoves of 51,000 sq. ft. heating surface each, or a total heating surface of 255,000 sq. ft. It is being supplied with air by five vertical reciprocating blowing engines. For the month of August, the average daily blast requirement for this furnace was 55,180 cu. ft. per min., with average blast pressure of 16 lb. The average blast temperature maintained was 1144 deg., with an average top gas temperature of 485 deg. A total of 62,594 gross tons of coke, ore, stone, cinder, scale and scrap was consumed in this furnace during the month. The gross metallic yield of mixture was 37.92 per cent. On account of this low yield, 9227 lb. of coke, ore, stone, cinder, scale and scrap were required to produce one ton of iron. Coke consumed per ton of product for the

month was 2581 lb. Of the total ore consumed 94 per cent was hard red hematite, the remaining 6 per cent being converter slag, which was added to maintain the percentage of manganese desired in the iron. The furnace produced a total of 15,195 tons of iron for the month, with an average daily run, for the 31 days, of 490.16 tons.

At present, with the exception of one Ensley stack, all the furnaces waste their slag on fills adjacent to the furnace plants. Slag is transported to these fills in cinder ladle cars of capacity varying from 150 to 395 cu. ft., some hand dumps, but the majority operated by steam. Slag is removed from these fills by either steam or electric shovels, a portion of which is crushed, sized and cleaned and disposed of for concrete aggregate, the remainder being used for railroad ballast, etc. A portion of the fines produced from the crushing plant at Ensley is used, with the addition of Portland cement, for the manufacture of building brick.



R. S. McCAFFERY

## Constitution of Blast Furnace Slags

BY RICHARD S. McCAFFERY\*

RICHARD S. McCAFFERY was graduated in 1895 from the School of Mines, Columbia University, as engineer of mines. He was personal assistant on research work to Henry M. Howe and an instructor in metallurgy, Columbia University. Between 1900 and 1914 he was superintendent and afterwards manager of the Santa Fe Copper Co., superintendent of the Copper Corporation of Chili, manager of the Salt Lake Copper Co., general superintendent of the Tintic Melting Co., manager of the Glamorgan Works and professor of metallurgy at the University of Idaho. Since then he has been professor of metallurgy at the University of Wisconsin.

THE metallurgical laboratory of the University of Wisconsin has for some time past carried on research work to determine the physical properties of blast furnace slags. To simplify the problem in the beginning we considered only those slags composed of silica, alumina and lime; but when the work was extended to include slags containing magnesia, as well as the above three constituents, we realized that we would have to make models to represent the slag composed of four constituents, as it was no longer possible to represent satisfactorily a four component system by means of a drawing in a plane and all blast furnace slags contain some magnesia.

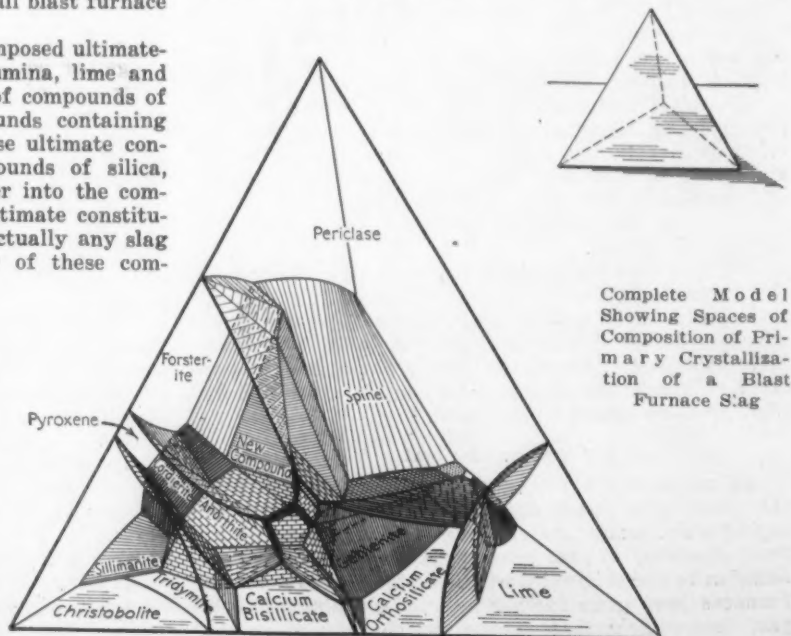
Although blast furnace slags are composed ultimately of the four constituents—silica, alumina, lime and magnesia, they are actually composed of compounds of these substances, some of the compounds containing two, some three and some four of these ultimate constituents. In all, there are 17 compounds of silica, alumina, lime, and magnesia that enter into the composition of slags, in addition to the ultimate constituents themselves, or 21 in all, so that actually any slag may contain one, two, three or four of these compounds or ultimate constituents. [These 21 components are given in a table in the paper.]

The problem then is to determine how these 21 different components go into solution, one in the other, and what effect varying amounts of these components have on the physical and chemical properties of the slag.

Of the many possible types of solution, it happens that these 21 components form among themselves solutions of only two types. One, and

by far the commonest type in slags, is like the solution formed by metallic lead and tin, with a eutectic at some intermediate composition, and the other type is like the solution of gold and silver, which forms an isomorphous series.

The system of four components, the sum of which is 100 per cent, cannot be represented by drawings on a plane, so that it was necessary to construct space models. The situation was somewhat simplified by the fact that all the binary systems in the four component systems  $\text{CaO}$ ,  $\text{MgO}$ ,  $\text{Al}_2\text{O}_3$ ,  $\text{SiO}_2$ , formed either simply



\*Professor of Metallurgy, University of Wisconsin, Madison, Wis.



eutectic mixtures or isomorphous solutions. It is possible to use the equilateral tetrahedron to represent a four component system, for, in such a solid, if perpendiculars are drawn from any point within to the four sides, the sum of these perpendiculars will be a constant.

Using then the equilateral tetrahedron to represent the four component system  $\text{CaO}$ ,  $\text{MgO}$ ,  $\text{Al}_2\text{O}_3$ ,  $\text{SiO}_2$ , the faces were constructed from the equilibria of the three component systems involved, and the interior of the tetrahedron was divided into tetrahedra of four component systems, the ternary eutectics were located on the faces of these interior tetrahedra and the quaternary eutectics were located inside each tetrahedron. The complete model [see illustration] shows the spaces of composition of primary crystallization, and from the location of the interior tetrahedra faces the approximate mineral composition of a slag of any composition can be determined.

A great many interesting things were brought out by a study of the  $\text{CaO}$ ,  $\text{MgO}$ ,  $\text{Al}_2\text{O}_3$ ,  $\text{SiO}_2$  model. For example, the authorities say that in considering blast furnace slags, the chemical equivalent in  $\text{CaO}$ , of the  $\text{MgO}$  present may be added to the  $\text{CaO}$  present. This is totally and completely wrong, for any slag which contains  $\text{MgO}$  has, as a part of its composition, some of the magnesia minerals present. The physical properties of these magnesia minerals are quite different from the non-magnesia minerals in slags. It is immediately recognized that the addition of the chemical equivalent of the  $\text{MgO}$  to the  $\text{CaO}$  is incorrect.

There is another point clearly brought out by a study of the  $\text{CaO}$ ,  $\text{MgO}$ ,  $\text{Al}_2\text{O}_3$ ,  $\text{SiO}_2$  model. There are certain slag compositions which, if used in the blast

furnace, give operating results that vary greatly if there is a comparatively small change in the ultimate composition of the slags. The reason for this is that any slag is composed of four and only four components or mineral entities and the physical properties of these components determine the physical properties of the slag. These slags are of such composition that a slight variation in the percentage of one or more constituents present, will change greatly the blast furnace operating results on slags. This matter of critical slag composition has been checked over with some blast furnace superintendents, who agree in placing these critical ranges of composition where the space model indicates they are located.

To investigate the location of typical slags in the space model, another model on a larger scale was constructed taking in that part of the larger system that included the composition of all blast furnace slags and in this model were plotted a large number of American, English, French, German and Swedish blast furnace slags that were chosen to show the greatest possible variation in composition. [The data concerning these slags are shown in tables and the analyses are plotted in illustrations in the paper.]

As a result of our study of the constitution of blast furnace slags, we believe we have at last given a scientific explanation of their constitution that fits in with known facts, which is in accordance with the latest ideas of physical chemistry, and which affords an easy and logical explanation for many things that had not been satisfactorily explained before. It also harmonizes many of the observations that had been made by furnace men, which seemed till now diametrically opposed to each other.

## Slag Brick and Other Slag Products

BY C. E. IRELAND\*

C. E. IRELAND, vice-president and sales manager Birmingham Slag Co., Birmingham, Ala., has been actively identified with the crushed stone and slag industry for the last 20 years. His father, C. L. Ireland, of Van Wert, Ohio, was one of the pioneers in the crushed stone business in the middle west. Eight years ago C. E. Ireland, with his two brothers and his father, purchased the Birmingham Slag Co. The old plant was almost at once replaced by a modern one, electrically operated. Soon a second plant was built to meet the demand for screened slag from the surrounding States. In 1922 a brick and tile plant was installed, adjoining the older slag plant. Mr. Ireland was one of the organizers of the National Slag Association, Cleveland, and is now its vice-president.



C. E. IRELAND

THIS paper treats of blast furnace slag, the development of its manufacture in the Birmingham, Alabama, district, and its uses and adaptability as an aggregate in concrete products.

When the furnaces started producing slag it was necessary to dispose of it as cheaply as possible, and to do this it was poured from tall pine pole trestles located near the furnaces. This method gradually built up mountains of slag. No care was exercised in pouring the slag in these piles. Most of this slag was marketed as railroad ballast, but even then the waste materials were objectionable, in that they held moisture and shortened the life of the cross ties.

When slag was finally brought into use as a concrete aggregate, sizing was difficult on account of waste materials being hard to separate from the slag, and also because of the flat, elongated and porous pieces caused by the slag being poured down steep embankments and allowed to cool quickly in thin sheets.

### Preparing Slag for Commercial Use

To overcome the objectionable features of preparing the slag for commercial use, the steel company,

together with the slag company, worked out and put into use what is known as the modified pouring pit system. Four pits, 1000 ft. long, 50 ft. wide and 15 ft. deep, are used. These pits are adjacent and require only two pouring tracks, reducing trackage to a minimum. They are located near the furnaces and are permanent, since they are constantly refilled when excavated by shovels of the slag company. These pits are filled with only clean slag, and as the slag is poured into these pits it puddles itself into thick layers and cools very slowly. Upon being excavated by electric shovels the slag breaks into large, solid, cubical pieces, and is loaded into trains. It is dumped from these trains into a hopper over the crushers, the crushers being located below the ground level. Two 8-yard skips elevate the slag from the crushers to the top of the plant, where it is fed onto the screens over magnetic pulleys, which catch all slag that contains iron. Large pieces of iron, sometimes 3 ft. in diameter, are caught.

In passing through the screens nine different sizes of slag are produced, from 4 in. down to dust. Large pieces of slag, from 6 to 20 in., are produced for the United States Government and used on the Mississippi

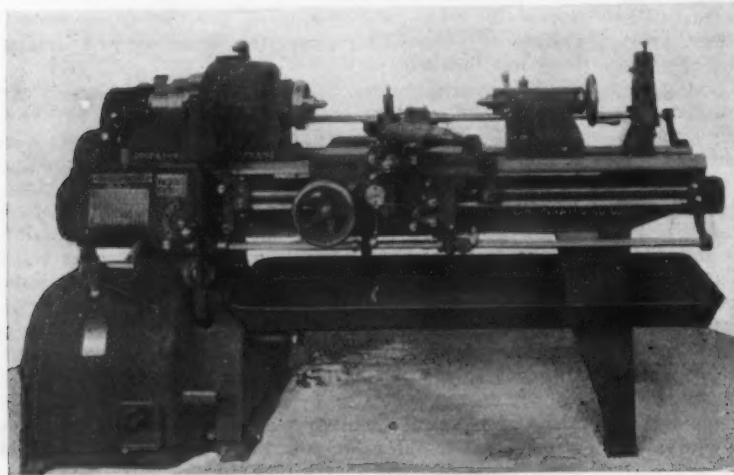
\*Sales manager, Birmingham Slag Co., Birmingham, Ala.

(Continued on page 1179)

### New Toolroom Lathe

A 12-in. toolroom lathe, the features of which include the motor drive arrangement and the universal relieving attachment, has been placed on the market by the Lodge & Shipley Machine Tool Co., Cincinnati.

The machine, which is illustrated herewith, is equipped with a three-step cone and double friction back gears, using multiple plate clutch. The drive is



The Motor-Drive Arrangement and the Universal Relieving Attachment Are Features

by means of a 3-hp. reversing motor mounted on a hinged plate beneath the headstock. The drive is direct from the motor to a ball-bearing countershaft, the belt from the countershaft to the machine passing over a ball-bearing idler. The weight of the motor plate and countershaft serves to maintain tension of the belt. A treadle arrangement is provided for raising the motor plate to relieve belt tension when shifting. The belt shifting mechanism is operated by a convenient lever.

The universal relieving attachment is designed to relieve straight or spiral flutes and will also handle end relieving, interrupted flutes, coarse lead hobs, etc., through any position in the circle and up to  $3/16$  in. It will also work in conjunction with the taper attachment. Due to the length of the splined shaft actuating the carriage and the fact that no universal joints are employed, the attachment is effective at any working position along the bed. This shaft is controlled in a gear box, the drive to which is taken from a sliding gear on the back gear shaft, thereby avoiding additional wear of the spindle-driving back gears due to the use of the attachment. The entire relieving mechanism is at the rear of the lathe.

The amount of relief may be varied without stopping the lathe by a pinion at the side of the carriage rest. The shaft on which this pinion is mounted is graduated, may be turned by hand and locked in position. The cam used is of the single lobe type.

Multiple plate disk clutches in the apron for both longitudinal and cross feeds are engaged and disengaged by a single lever. Suitable safety devices are provided.

The lathe swings  $14\frac{1}{4}$  in. The thread range is from 128 per in. to 4 in. lead and feeds as fine as 0.0025 in. are available.

The Interstate Commerce Commission, passing upon the complaint of the Southern Wire & Iron Co., et al., has modified findings in the original report to the extent of awarding reparation in the full amount of the difference between the rates paid on iron and steel articles in carloads from St. Louis, Pittsburgh and other points to Dallas and Harbys, Tex., and the rates which would have accrued upon the basis found reasonable. It was held in the original report that the rates were unreasonable to the extent that they exceeded the combinations by way of Shreveport, La.

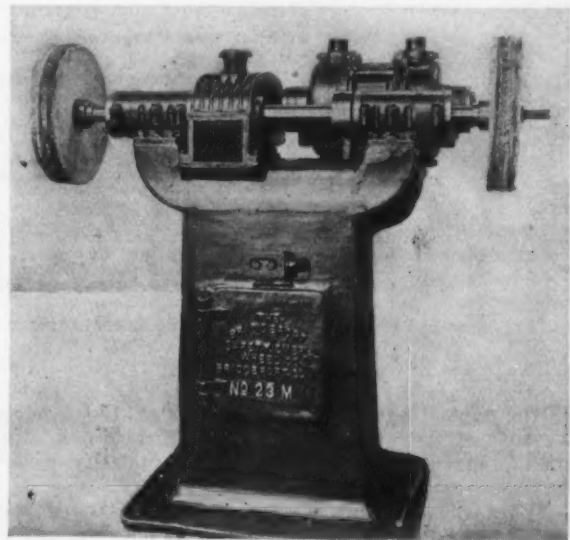
### Buffing Lathes with Silent Chain Drive

An alternating-current motor driven buffing lathe equipped with a silent chain to the buffing spindle has been brought out by the Bridgeport Safety Emery Wheel Co., Inc., Bridgeport. Three sizes of the machine are available.

The machines are said to have been developed because alternating current motors of 60 cycles, 2 or 3 phase, have to be wound to run at 1800 or 3600 r.p.m., the lower speed being rather slow unless extra large buffs are used, and the higher speed, very high unless small-sized buffs are employed. In the machine illustrated it is intended that by using appropriate sizes of chain sprockets the buff spindle may be brought within close range of the speed desired.

The driving motor is mounted on a bracket cast integral with the pedestal at the back, the center of the motor shaft being horizontally back of the buffing spindle. The two are connected by silent chain drive and the chain runs in an oil-tight case, with an oil bath at the bottom. The motor and buffing spindles are mounted in ball bearings, the buffing spindle having four sets, one at each end of each box. The boxes are provided with an oil reservoir into which the balls dip to one-half their diameter at each revolution of the spindle.

The motor employed is of 2, 5 and  $7\frac{1}{2}$  hp., respectively, for each size of machine. The spindle speeds are 2500 and 2400 r.p.m. The diameter of the spindle in the bearings is  $1\frac{1}{4}$  and 2 in., and the length of the bearings is 9 and  $10\frac{1}{2}$  in. The height from floor to center of spindle is 40 in. and 37 in. The overall dimensions of the smallest machine are 27 in. wide,  $55\frac{1}{2}$



The Drive Is from the Motor by Silent Chain. Speed of the buff spindle may be varied by using sprockets of suitable size

in. long and 47 in. high; the same dimensions for the largest machine being 28 in., 65 in. and 45 in. The weight is 970, 1200 and 1350 lb., net, respectively.

Employment in manufacturing industries increased 2.1 per cent in September over August, according to the United States Bureau of Labor Statistics. Total earnings increased 3.3 per cent and per capita earnings, 1.2 per cent. The data are based on 8820 establishments in 52 industries and employing 2,548,989 people.



## NEW BOLT HEAD TRIMMERS

### Automatic Machines for Blanks Up to $\frac{5}{8}$ -In. Diameter—Cross-Slide Operating Mechanism a Feature

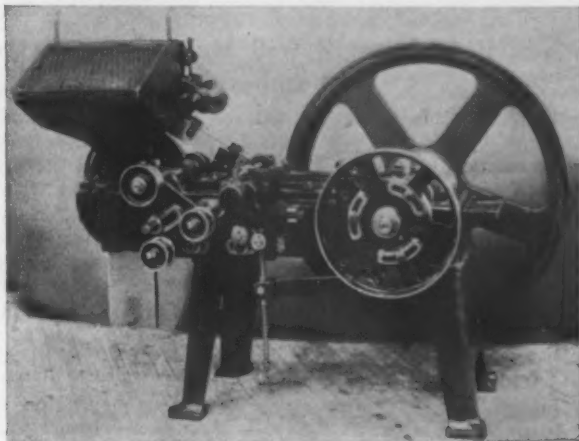
A new line of automatic machines for trimming the heads of cold-headed bolts and screws into square, hexagonal or other shapes, has been placed on the market by the Waterbury Farrel Foundry & Machine Co., Waterbury, Conn. Three standard sizes are available, for trimming blanks up to  $\frac{5}{8}$  in. in diameter, and in lengths ranging from  $\frac{3}{4}$  to 8 in. under the head.

Blanks up to 4 in. in length are fed automatically from a hopper into a chute and thence to the device

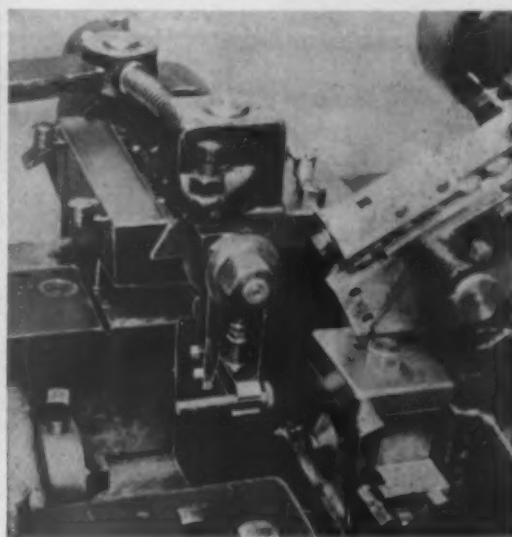
compression of a spring on the connection between the cam lever and the slide.

The oscillatory motion of the spring-finger shaft is also positively stopped at both extremities of its arc. In case of obstructions to the full angular movements of the fingers in either direction, the incompleting movement is taken up by one or the other of the two springs in the connection between the cam lever and the finger shaft. This device is called a compensator. In the normal operation of the device a slight overtravel on the cam is taken up alternately by the springs, assuring that the fingers will be held firmly against the adjustable stops at both extremities of their angular travel.

The blanks may be trimmed by either pushing them



General View of Direct Driven Automatic Bolt Head Trimming Machine. Details of the transfer mechanism are shown in close-up view at the right



which transfers them to the trimming tools; blanks longer than 4 in. are usually placed into the chute by hand. The blanks are picked out of the chute from the side by a pair of spring carrier fingers fixed to an oscillating shaft, which has bearings in a cross-slide.

With the slide in its backward position and the fingers swung up to the chute angle, the sequence of operations is as follows: The slide advances toward the feed chute and the spring fingers snap over a blank, draw it out, swing it down to the position shown in the detail illustration herewith, carry it in to the centerline of the tools, and hold it there until after the hollow trimming punch has advanced to encompass the shank. The slide then recedes and the fingers snap off of the blank. The slide is then in its rearward position, so that the fingers can again be swung up to the chute angle preparatory to the next cycle of operations. The hollow punch telescopes over the shank until it comes up against the underside of the head and forces the head of the blank into the trimming die.

The cross-slide operating mechanism is a feature particularly stressed by the makers. The slide is cam-actuated, and the cam lever has a safety device to prevent breakage in case an obstruction should prevent the full traverse of the slide. The cam lever is made up of two levers which act as one as long as the free movement of the slide is not obstructed; otherwise the joint which ties the two levers together becomes disengaged and the slide inoperative. The joint consists of a flat spring having a tapered lug attached to one of the levers which engages a groove in a plate attached to the other lever. If the slide is prevented from making a full traverse, the lug on the spring becomes disengaged from the groove, thus breaking the joint and stopping the movement of the slide. On the next succeeding stroke of the machine the joint becomes connected automatically.

The cam which actuates the slide has a slight overtravel and the innermost position of the slide is determined by an adjustable stop. When the slide reaches this stop the overtravel on the cam is taken up by the

through or by ejecting them back out of the die after being trimmed by means of a knock-out. If the space between the punch and the die will not permit two blanks to be held in line, it is necessary to use the knock-out and eject the work from the die. For medium and short work the blanks are trimmed by pushing them successively through the die. The first blank is pushed into the die until its head is nearly trimmed, leaving the shank extending. The second blank is held in front of the extending end of the first blank and the second blank then acts as a ram to abut against the extending shank of the first blank, pushing it through the die.

To accommodate the machine for either method of trimming, it is necessary to relocate the transfer slide along the bed, toward or away from the die. To simplify this adjustment the hopper feed and the cross-slide are mounted on an apron so that the two can be moved as a unit without disturbing their relationship.

For work that is so long that it must be ejected each time from the die, a die knock-out is employed. This knock-out is operated from the gate and consists of a fulcrum lever, the end of which bears against a knock-out pin extending through the frame of the machine and into the die. In this method of trimming, the nose of the punch is slightly smaller than the die opening so that it will enter the die far enough to complete the shear in one stroke.

In all cases the punch is provided with a knock-out which is a rod extending into the hollow punch. For extremely short blanks it is necessary to employ a special sliding spring punch and to thin the carrier fingers to avoid interference between the punch and the fingers as the latter recede.

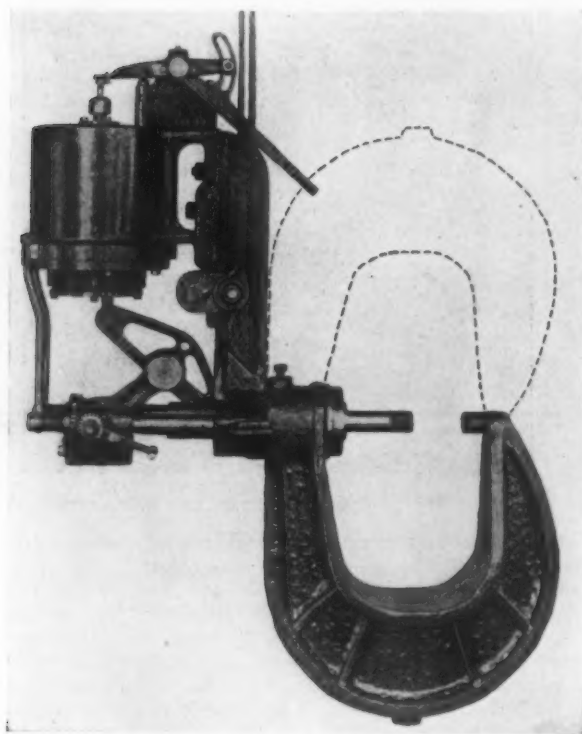
The two smaller machines are direct-driven and the largest size is back-geared. The production from the three machines is claimed to be 65, 50 and 35 blanks per min., respectively. The required horsepower 5,  $7\frac{1}{4}$  and 10, respectively. The weight of the machines without countershaft ranges from 2200 lb. to about 8000 lb. net.

### Special Riveter for Structural Shops

A special column riveter with features of interest to structural shops and which has been placed on the market recently by Hanna Engineering Works, 1765 Elston Avenue, Chicago, is shown in the accompanying illustration.

Two frames are available for mounting on the one head. One, the frame illustrated, has an 18-in. reach and 16-in. gap; the other, a smaller frame, having a 9-in. reach and 12-in. gap. The machine is rated to drive  $\frac{3}{8}$ -in. structural rivets. Equipped with the larger frame the machine weighs 1573 lb.; with the smaller, 1465 lb.

The frame may be rotated and employed in the positions indicated in the illustration, which is a fea-



Special Riveter with Frame that May Be Rotated and Employed in Either Position Indicated

ture emphasized as permitting the machine to work clear across the stiffening angles of the web of the girder on edge, which is twice as deep as the reach of the machine, without turning over the girder or dropping the machine. It also permits of riveting cover plates to girders laid on their sides, driving rivets through both the upper and lower legs without turning over the girder or dropping the machine.

The machine is equipped with a plain toggle mechanism, the inner toggle being extended for attachment of the piston rod, as shown. The outer toggles pivot at their outer ends in a nut block that is adjustable in and out on two strain rods, which are mounted in turn in the head casting carrying the cylinder. The inner end of the inner toggle pivots in a plunger that is free to slide in and out in the head casting. The movable rivet die is mounted in the other end of the plunger. The strain yoke or frame is bored at the end of one leg to fit over a journal turned on the head casting of the mechanism, this journal being concentric with the axis of the plunger and die. It is possible to pivot or rotate the frame on the head when mounted on the journal, and the hole in the end of the other leg of the frame for the dead die being concentric with the larger bore upon which the frame rotates, this rotation does not affect die alignment.

The force set up by the pressure between rivet dies,

which tends to pull the frame off the head journal, is taken on a nut threaded upon the journal outside of the frame bore. This nut serves also to lock the frame in a given position on the head. Adjustment of the gap between the dies is made by screwing the nut block in or out on the strain rods, which is accomplished by means of a hand crank, bevel and spur gears.

The operating valve is of the four-way slide "D" type. On the return stroke the piston, when reaching the extreme of its travel, will force the valve to neutral or "off" position, this being accomplished by means of a "tell-tale" pin through the cylinder head and a lever mounted on the valve stem. The device is claimed to save considerable air.

### New Blast Furnace Will Manufacture Ferrophosphorus

A new blast furnace will be erected at Rockdale, Tenn., by J. J. Gray, manufacturer of ferrophosphorus. The existing furnace will be dismantled and replaced by a considerably larger stack 70 ft. in height with a 12 ft. hearth. Although the manufacture of ferrophosphorus is ordinarily confined to an electric furnace, Mr. Gray has for several years produced this alloy in a blast furnace under a process on which he controls the patents. Operations, however, have been on a rather small scale. Local ore is used from a mine located at Iron City, Tenn.

On account of the peculiar difficulties and hazards incident to the manufacture of ferrophosphorus, the furnace will be provided with a specially constructed tight hearth and bosh, the hearth jacket being of cast iron with machined joints. The tuyere breast and bosh jacket will be of very heavy construction specially designed for cooling and provided with heavy steel bands to assure against the escape of the phosphorus produced in the smelting operation. The contract for the design and construction of the furnace has been placed with Arthur G. McKee & Co., Cleveland.

### Iron and Bronze Manufacturers Will Carry on Advertising Campaign

The National Association of Ornamental Iron and Bronze Manufacturers, which held its seventeenth annual meeting in Cleveland, Oct. 22-24, appointed a committee to prepare for a \$50,000 advertising campaign to stimulate the demand for the products of the members. Among the resolutions adopted was one calling for the appointment of a committee on uniform cost accounting and another for the organization of local associations in industrial cities. F. H. Howe, Columbus Wire & Iron Works, Columbus, Ohio, was reelected president. R. P. Lipheart, Richmond Structural Steel Co., Richmond, Va., was elected first vice-president, William K. Ross, Albee-Godfrey Whalecreek Co., New York, second vice-president, and A. L. Woodbridge, Woodbridge Ornamental Iron Co., Chicago, third vice-president and Thomas E. Griffith, W. S. Tyler Co., Cleveland, fourth vice-president.

The Zenith Furnace Co., Duluth, Minn., had four steel tanks 25 ft. x 20 ft. high, in which it stored ammoniacal liquor from its coke by-product plant. Corrosion had destroyed the roof of one of them, damaged the other roofs and had eaten holes through the tanks in a number of places around the top. It was a question of the possibility of repairing these tanks as against taking them out and replacing them with new ones. The Cement-Gun Construction Co., Chicago, placed a gunite lining in all four tanks and put a gunite roof on the one which was destroyed. This was done without interrupting their service, except to empty one tank at a time, and 48 hours after the placing of the gunite, the tanks were filled with hot liquor.



### Bench Type Screw Thread Comparator

The bench-type Hartness screw thread comparator placed on the market by the Jones & Lamson Machine Co., Springfield, Vt., and demonstrated at recent exhibitions of machine tools, is shown in the accompanying illustrations.

The instrument incorporates the essential elements of the standard Hartness comparator, previously described in *THE IRON AGE*, but is smaller and more compact. It indicates by large magnification how the screw will fit in the nut or tapped hole, permitting of rapid comparison of all elements of production screw threads with a master screw which is known to be correct. The pitch diameter, form and lead of screws or taps may be compared with a master, the extent to which any of these elements vary from the master being shown.

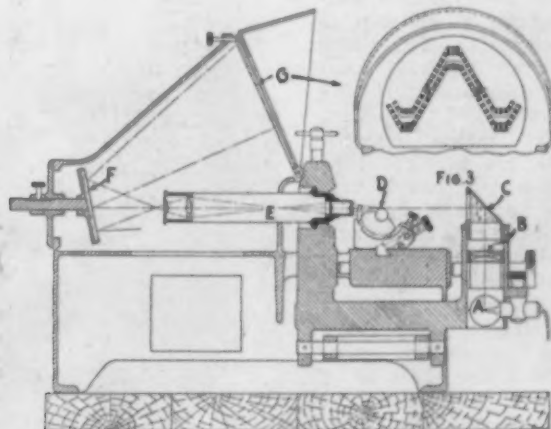
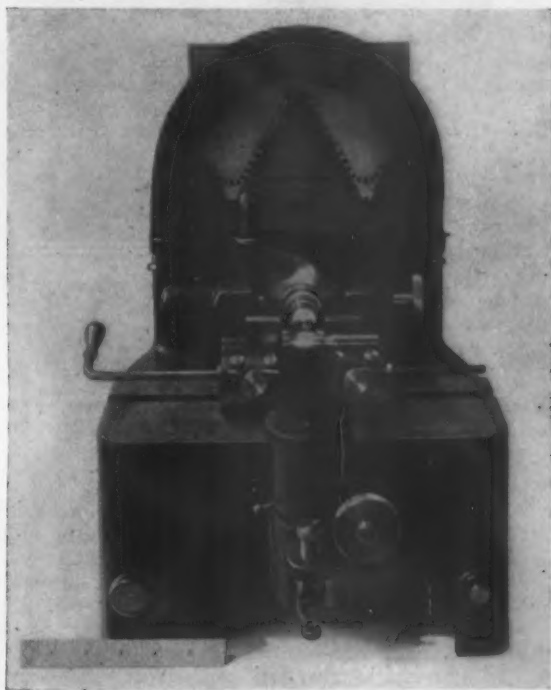
The accompanying cross section view of the instrument, at right, shows the light rays passing from a 6-8V-32 cp. Mazda lamp, A, through condensers B, to the prism, C, which reflects it across the work, D. The light rays then pass through the microscope, E, to the mirror F and back to the chart G. The outline of the thread, 50 times magnified, is shown on the tolerance chart (as in Fig. 3) at a distance of approxi-

spaced longitudinally from the center of the lens a distance equal to the length of engagement of the screws being inspected. The second threaded cradle is free to move endwise to compensate for lead errors.

### Gain in Farm Equipment Output in 1923

The production of 1069 establishments manufacturing farm equipment in 1923 amounted to \$364,701,537, the Department of Commerce finds. This compares with \$209,639,897 from 986 establishments in 1922 and with \$328,040,783 from 1146 establishments in 1921. The sharp decrease in 1922 from the previous year is accounted for by the fact that there was heavy overproduction in 1921, resulting in large stocks which had to be liquidated the next year. Sales by manufacturers in the United States in 1923 amounted to \$311,823,230, while export sales aggregated \$49,349,542, or 13.53 per cent of the amount manufactured.

Tractors and traction engines formed the largest item in each one of the three recent years, having accounted for \$93,782,550 in 1923 or more than 25 per cent of the entire output. In second place were ma-



Bench Type Comparator for Comparing the Elements of Production Screw Threads with a Master Screw. The arrangement of the component parts may be noted from the cross-section view. Fig. 3, at top, shows the tolerance chart in position

mately 15 in. from the eye. The operator sits directly in front of the instrument.

The instrument is adjusted by staging a master gage in the cradles so that the shadow of the thread directly in front of the lens will coincide with the upper outline on the chart. When the shadow of the thread is projected on the tolerance chart adjusted in this manner, it represents a perfect screw in a perfect nut. The master gage is then replaced by the production screw to be checked. To pass inspection the shadow of the production thread must fall between the upper, maximum, and lower, minimum, outlines on the chart, the space between the maximum and minimum outline representing the permissible tolerance which is determined by the class of fit required. If the shadow of the production thread is displaced longitudinally it indicates that there is an error in lead; vertical displacement of the shadow represents pitch diameter variation.

The equipment for inspecting screws consists of cradles in which screws are held for inspection, master gages with which the work is compared and tolerance charts on which the shadows of the threads are projected for comparison. The fixed threaded cradle is

chines for preparing crops, such as threshers, corn huskers and shellers, hay presses, etc., with a total of \$30,761,122. Harvesting machinery with \$26,278,076, horsedrawn vehicles with \$24,332,852, plows and listers with \$24,252,181, haying machinery with \$15,503,296 and cultivators with \$13,346,564, followed in that order in 1923.

Tractors and traction engines furnished also the largest single item of export sales, with \$14,681,512, followed by harvesting machinery with \$10,792,116, machines for preparing crops \$5,838,104, plows and listers \$4,672,863. It is noteworthy that more than 41 per cent of the harvesting machinery was shipped abroad. In 1921 this percentage was more than 32.

The executive committee of the American Society for Testing Materials at its recent quarterly meeting decided to hold the 28th annual meeting of the society at Atlantic City, N. J., June 22-26, 1925, with headquarters at the Chalfonte-Haddon Hall hotels.

### Electric Butt Welding Machines with Automatic Features

Two electric welding machines incorporating automatic features have been placed on the market by the Thomson Electric Welding Co., Lynn, Mass. The machines, which are illustrated herewith, are designated as the models 15 and 25 SP butt welders, respectively.

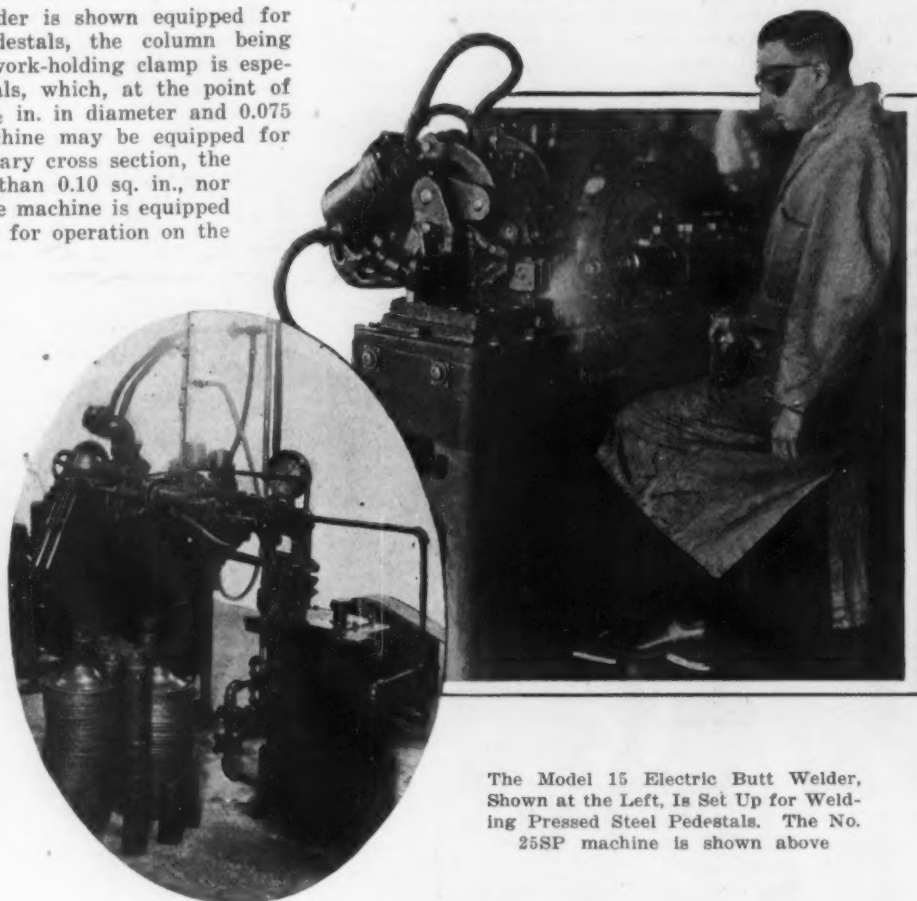
The model 15 butt welder is shown equipped for welding pressed steel pedestals, the column being welded to the base. The work-holding clamp is especially designed for pedestals, which, at the point of weld are approximately  $2\frac{1}{2}$  in. in diameter and 0.075 in. in thickness. The machine may be equipped for welding stock of any ordinary cross section, the area of which is not less than 0.10 sq. in., nor greater than  $\frac{1}{2}$  sq. in. The machine is equipped with a 62-kva. transformer for operation on the usual commercial alternating current lines.

In operating the machine the parts to be welded are inserted and clamped by hand. The operator then trips a hand lever located conveniently at the top of the machine. This turns on the current automatically and starts the movement of the platen, which "flashes" the work until the required heat is obtained, then delivers the final welding pressure and cuts off the current. In the machine illustrated the pressure is generated by means of an Oilgear pump which may be driven either from a line shaft or by motor. As soon as the clamps open, the platen returns to the starting position, ready for the next welding cycle.

The rate of production is said to depend upon the speed of inserting and removing the work. The time of current flow on the welding of the pedestals is said to be approximately 2 sec., which is emphasized as indicating the high speed of operation. Special attention is said to have been given to making the machine "flash proof" and also to provision for continuous operation.

The model 25 SP butt welder, shown in the right-hand illustration, is also intended for welding iron or steel parts of 0.10 to  $\frac{1}{2}$  sq. in. cross section, inclusive, and is adapted for either flat, square, round or irregularly-shaped stock. It has an electrical capacity of 60 kva., with 83 power factor, and is available to operate on 220, 330, 440 or 550 volt a. c. lines of any frequency from 25 to 60 cycles. In this machine clamping of the

work is by means of air pressure, eliminating fatigue of the operator from this source. The pieces to be welded are moved together mechanically by means of cams, the initial drive being from the line shaft or motor as desired. It is claimed that the machine illustrated, which is set up for operating on stock of 0.15 sq. in. cross section, will weld as fast as the operator can feed the work into the pneumatic clamps, up to a speed of 1800 pieces an hour.



The Model 15 Electric Butt Welder, Shown at the Left, Is Set Up for Welding Pressed Steel Pedestals. The No. 25SP machine is shown above

In operating the machine the work to be welded is placed in the clamps, after which the operator steps on the pedal, which closes the clamps. After the work is properly gripped, the current is turned on automatically and the machine starts "flashing." Upon completion of the weld, the clamps open and return to the starting position. The entire cycle of operations is actuated by a single movement of the foot pedal and is accomplished in 2 sec.

The machine is said to require a minimum of air, mechanical power and electric current for the work. Special care is said to have been given to safeguarding the moving parts of the machine from flash, parts thrown off from the work being prevented from getting into the moving parts of the machine.

### Federal Trade Commission Acted Without Authority, Declares Lawyer

Addressing the convention of the American Hardware Manufacturers' Association at Atlantic City, on Oct. 16, Felix H. Levy, a member of the New York bar and special counsel to the Department of Justice under President Roosevelt's administration in connection with the prosecution of the tobacco trust, declared that he has no doubt whatever that the Federal Trade Commission acted without legal right in proscribing the Pittsburgh plus pricing system. It is his belief that had the order been appealed from, as the law permits, it would have been reversed.

Mr. Levy, who has been active for 30 years in industrial suits brought under the Clayton and Sherman acts, has made an intensive study of the litigation on Pittsburgh plus. He expressed the belief that the spirit

of the old pricing system still hovers about and may eventually return in another form under pressure of economic necessity. In his comment he said:

"Strong and apparently well-founded opinion exists to the effect that the Trade Commission had no legal right to make its order prohibiting the Pittsburgh plus system and that if the Steel Corporation had taken an appeal from such order the Circuit Court of Appeals would have reversed the order. It is an interesting question whether the Steel Corporation willingly waived its right to take such an appeal with the resulting probability of success in doing so solely out of regard for public sentiment and in keeping with the high-minded policy which has always characterized it; or whether it foresees advantage in the future in complying with the commission's order. It is a fair conjecture that it is the former and not the latter reason which actuated the Steel Corporation."



## THE TIN DEPOSITS OF MEXICO

Some Favorable Reports, but Thus Far No Considerable Operation

BY KIRBY THOMAS

The failure to realize any successful tin mining operations in the United States under the war stimulus to the general mining industry, except one inconsiderable but now promising property in South Dakota, renews interest in the possibilities for tin mining in Mexico. The Mexican tin deposits have been long known. In fact, they were worked in pre-Cortez times and there has been a continuous production on a small scale in various parts of the Republic. At no time has the total output of the Mexican tin mines reached any large proportions, and the industrial operations have been on a small scale, and mostly by the Mexicans. About 25 years ago, a Pittsburgh syndicate undertook the development of tin in Durango. This undertaking was unsuccessful, partly because of the extravagant ideas of its backers, but chiefly, of course, by reason of the failure to find tin in large commercial quantities. This failure had a

great deal to do with the neglect of the Mexican tin resources.

During the later years of the Porfirio Diaz administration, several serious and reasonably promising attempts to develop these Mexican tin deposits were made. Notable among these were the operations in the western part of the State of Aguas Calientes, in the southern part of the State of Zacatecas, and near San Luis Potosi. Other promising but less accessible deposits, on the border of Durango and Zacatecas and in the south of Mexico, were controlled with the view of later developments. It is known that the limited explorations which had been made on some of the more promising of these Mexican tin deposits resulted in favorable reports by engineers from the United States, and serious operations were planned. It is expected that the resumption of mining in Mexico will result in a continuation of these operations and probably in the inauguration of new ones. Well posted authorities express the opinion that tin mining in Mexico will be a successful industry. Considering the widespread occurrence of tin reported, it is expected that tin mining in Mexico will not be confined to a single locality.

## Machine for Welding Rims

An automatic electric rim welder designated as the No. 45 and which may be used on either flat, round or irregularly-shaped stock, has been placed on the market by Thomson Electric Welding Co., Lynn, Mass. Production of 600 rims of the usual size an hour is claimed, the time of current flow being 2 sec. Absence of scrap because of automatically controlled current and pressure is a feature emphasized.

The general arrangement of the machine may be noted from the accompanying illustration. A comparatively large transformer, 150 kva., is employed, and the machine may be furnished for use on any ordinary commercial alternating current line. The Oilgear pump shown at the right of the machine is employed to apply pressure as needed to effect the weld. The pump and the machine are mounted on a special base, as shown, to provide the rigidity required for high-speed operation. Special attention is said to have been given to preventing the entrance of particles of the work into the machine.

The cycle of operations is as follows: The operator places the rim into the work-holding clamp and presses the foot pedal. This actuates an air valve which closes both sides of the clamp and at the same time starts the welding operation. The welder flashes a predetermined amount, cuts out the current, makes the final push-up and stops. The operator then pushes the foot pedal again, whereupon the clamps open and release the rim, the platen returning to the starting position.

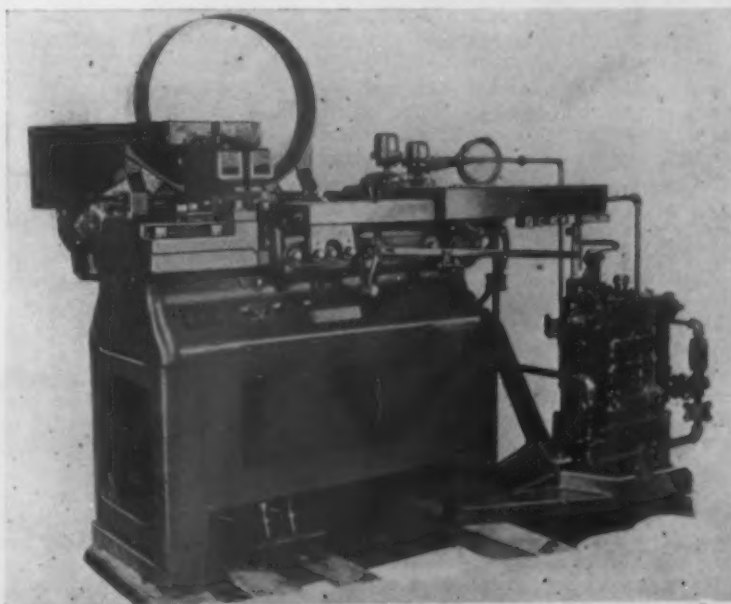
The machine may be equipped with two foot pedals, one for closing each side of the clamp. It may also be provided with a hand lever, the movement of which is approximately 1 in., for starting the actual welding. With the machine set up in this manner, the operator may inspect the clamping of each end of the rim during or after clamping, and it also provides time for the operator to move away from the direct line of the flash before he starts the machine in the welding operation. In this case, as in the first, the clamps are released and the platen returns to its starting position through another stroke of the foot pedal.

Plant and equipment of the Michigan Co., truck manufacturer, Detroit, has been destroyed by fire.

## Reclaiming Worn Gun Barrels by Nickel Plating

Reclamation of worn-out machine gun barrels by plating the bore with nickel or other suitable metal and then re-rifling has been suggested by the Bureau of Standards. This process was tried at the Bureau a few years ago, but at that time proved unworkable. Progress in the science of electroplating has been very rapid in recent years, however, and it is hoped that what was impossible then may be possible within a few years.

Gun barrels wear out through erosion of the rifling bands, and when these are worn down to a certain point the gun is no longer accurate. If the rifling could be rebuilt the gun would again be serviceable. This, the



Automatic Electric Rim Welder for Use on Flat, Round or Irregularly Shaped Stock. Production of 600 rims an hour is claimed

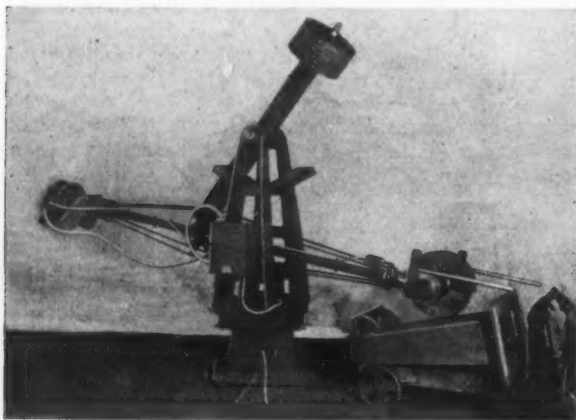
Bureau hopes, can be done if a sufficiently hard and dense deposit can be plated into the bore. The metals considered best for the purpose are nickel, cobalt, iron and chromium.

Most of the experiments were conducted with nickel because of the more advanced stage of nickel plating as compared with that of other metals. A taut platinum wire, centered in the bore, was used as an anode, and in order to furnish nickel a stream of fresh solution was constantly circulated through the barrel.

### Swing Frame Grinder Without Belts

A motor driven swing-frame grinder designed to eliminate belts, countershafts and overhead suspension has been placed on the market by the Bridgeport Safety Emery Wheel Co., Inc., Bridgeport, Conn.

The machine, which is designated as No. 174, will operate in or out, up or down, on horizontal surfaces or surfaces at an angle, and may be swung completely around its base. It is claimed to be in poise at all times and sensitive to slight effort of the operator. Simplicity and the protection provided to prevent the entrance of grit and dust into the operating parts are features.



The Machine Will Operate In or Out, Up or Down, on Horizontal or Angular Surfaces and May Be Revolved on its Base

In this design two counterbalanced arms are mounted on a horizontal plate, which may be rotated to any position. The center of gravity is always over the center of the base. The horizontal arm, which carries the grinding wheel at one end and is counterbalanced by the driving motor on the other, is a tubular member trussed with rods to provide strength and stiffness. The power is transmitted to the wheel spindle by a driving shaft coupled to the motor, running through this tube, and connected to the spindle by cut and heat-treated bevel gears. The driving shaft is carried by three large ball bearings, one at each end and one in the middle.

The grinding wheel is carried on the outboard end of the spindle, as shown, and the wheel may be changed conveniently by removing the wheel guard. The spindle is carried in large ball bearings, which are mounted inside of the housing for the bevel gears. This housing is dust proof and is filled with transmission oil, which assures continuous lubrication for the gears and bearings. The grinding head may be clamped on the horizontal arm or may be left free and easily held or revolved to any angle, on end or upside down, as the operator may desire.

Ease of horizontal rotation is obtained by a ball bearing turntable, the entire weight of the rotating member being carried on a circle of steel balls. A gib ring hooking in under the flange of the base, but not quite touching it, is intended to provide protection against grit and overturning. The machine is completely wired, and push button control is provided on the grinding head.

The annular working area of the machine is 3 ft. 8 in. inside radius, 8 ft. outside radius, 52 in. wide, the space required for complete movement being 20 ft. diameter, 8 ft. 8 in. high. The wheel is 16 in. in diameter and runs at speed of 1200 r.p.m. The weight is 2300 lb. net.

The Derry No. 1 plant of the Latrobe Connellsville Coal & Coke Co., at Burdenville, Pa., has resumed operations after being idle nearly a year.

### Steel Output in Canada Only One-sixth That of May

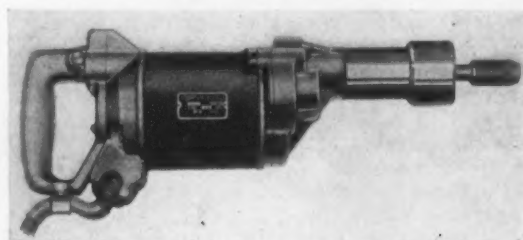
Steel production in Canada in September was 18,005 tons of ingots and castings, this being the smallest reported for a month since the first publication of monthly statistics, with the exception of May, 1922. The August output was 22,736 tons. The rate of operations in September fell to less than one-third the average monthly rate for the three quarters of the year, the total to the end of September being 581,711 tons—558,483 tons of ingots and 23,228 tons of steel castings.

A slight increase in pig iron production is shown for September, the total being 23,202 gross tons against 23,073 tons in August. There was thus an increase of about 3 per cent in the daily rate, September having one day less than August. For the nine months ended with September the total was 518,860 tons, or 165,736 tons less than for the same period in 1923. The high rate for the year both in pig iron and in steel production was reached in May, when the output of pig iron was about 85,000 tons and that of steel ingots about 108,000 tons. The September output of steel ingots was only one-sixth that of May.

### Friction Head Screw Driver

An electric screw driver, the driving head of which is equipped with a disk type friction clutch, which is regulated automatically according to pressure applied by the operator, has been placed on the market by the Hisey-Wolf Machine Co., Cincinnati.

The machine is equipped with ball bearings throughout, and the company's universal motor for operation on direct current and single phase alternating current of the same voltage and for any frequency from 25 to 60 cycles is employed. The external cable connector, which permits cable repairs and renewals without dismantling the machine, is a feature. The switch is fitted in the grip handle. The clutch casing is of convenient size and serves as an



Friction Head Screw Driver with Slot Finding Attachment

end grip when required. Two screw driving bits are regular equipment. A screw slot finding attachment, which is available on order, is intended to prevent the driving bit from slipping out of the screw slot and marring the surface of the work.

The capacity of the machine is for driving screws up to No. 14, 2½ in. long, in soft solid wood when suitable lead holes are provided, larger wood screws and lag screws up to 5/16 in. in diameter and 4 in. long may be driven. The machines may be used also for setting nuts up to ¾ in. in metal and wood.

The machine is 15½ in. long and 3¼ in. in outside diameter. The net weight is 9½ lb.

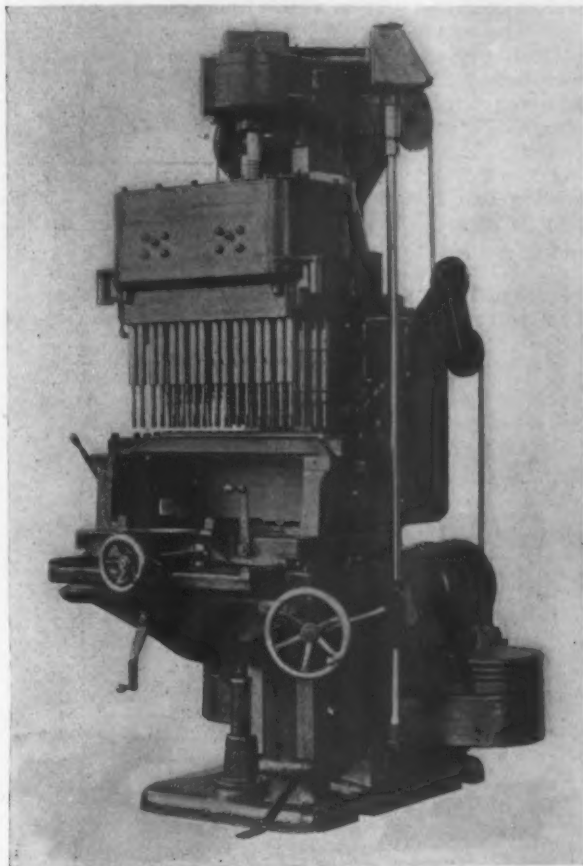
A directory of California Manufacturers has just been issued by the California Development Association, Ferry Building, San Francisco. It is declared in its foreword to be "step No. 1 in the program of the association to improve market conditions and to extend the markets for California manufactured products." It is published by the state wide industrial committee of the association of which Charles E. Virden is chairman. The contents are arranged for ease of reference.



### Multiple-Spindle Fixed-Center Drill for Cylinder Block Work

A special multiple-spindle fixed-center drilling machine for boring, reaming, counterboring and spot facing valve and valve stem holes in cylinder blocks for automobile motors has been brought out by the Defiance Machine Works, Defiance, Ohio.

As shown in the illustration, the machine is fitted with a 32-spindle head with tools for reaming and counter-boring valve stem holes in an eight-cylinder motor



Special Multiple-Spindle Drill for Boring, Reaming, Counterboring and Spot Facing Valve and Valve Stem Holes in Cylinder Blocks

block, but fixed-center heads with various numbers of spindles to suit requirements may be furnished. The machine may be fitted also with a head carrying adjustable spindles in a straight line with 30-in. maximum and 2-in. minimum distance between center of spindles. The spindles are fitted with No. 3 Morse tapers.

The feed mechanism is driven from the drive shaft through hardened steel gears and incorporates friction and hardened jaw clutches immersed in oil, with the end thrust taken against ball bearings. The machine has both power and hand feed and rapid traverse. The feed screw is of large diameter and of substantial pitch to operate the head up and down by either hand or power. The head is counter-balanced by weights and a cable chain traveling over rollers with large bearings. The table is available in either a knee or box type and is adjustable vertically, this adjustment being obtained by means of a crank lever which through a spiral gear mechanism actuates a heavy jack screw.

The unit type of construction is employed throughout. The head, feed and speed box are each a separate unit. Each unit is entirely independent and may be removed conveniently for inspection. The oiling method consisting of a force feed gravity flow and splash system combined is made possible by the inclosed unit

construction. The speed and feed mechanisms taken collectively and the spindle head separately are each provided with independent and self-contained oiling systems.

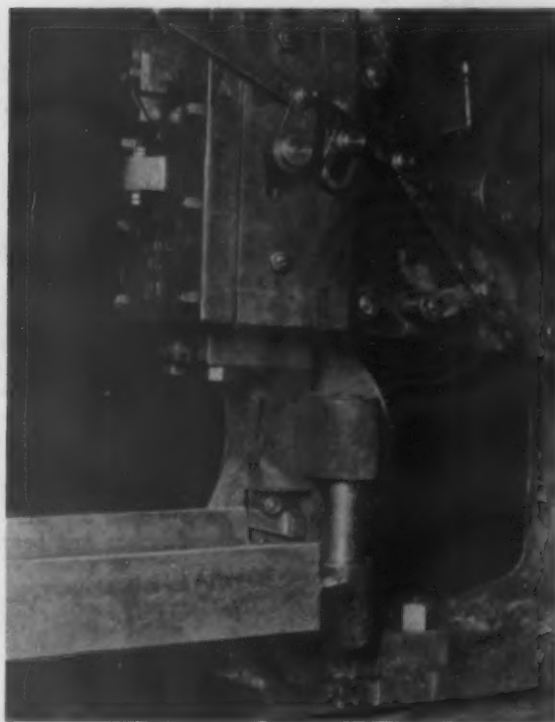
The machine may be arranged for a single-pulley belt drive or for a motor drive, with a 15-hp. 1150-r.p.m. motor. It occupies a floor space 64 x 96 in. and the weight is 11,350 lb. net.

### Coping Attachment for Buffalo Machines

A combination flange and web coping attachment for use with any of its punches, shears or combination machines having a high throat, has been placed on the market by the Buffalo Forge Co., Buffalo, N. Y. It is not intended for use with machines with standard low throat.

The attachment is designed to cope or notch channels, I-beams, Z-bars, tees, plates and angles, and is available in a range of sizes and capacities, each size having a specified capacity which corresponds to that of the machine with which it is to be used.

For webs and flanges, the coping attachment has six knives which are always in place, and an outstanding feature is the self-aligning arrangement of the knives. The upper knife holder is provided with a machined extension which slides in a corresponding guide in the lower knife holder. In addition, there are two vertical guide pins, which are fastened rigidly to the lower knife holder and extend upward to machined openings in the upper knife holder. These pins are intended to hold the knives in alignment by preventing any shifting or turning of either knife in relation to the



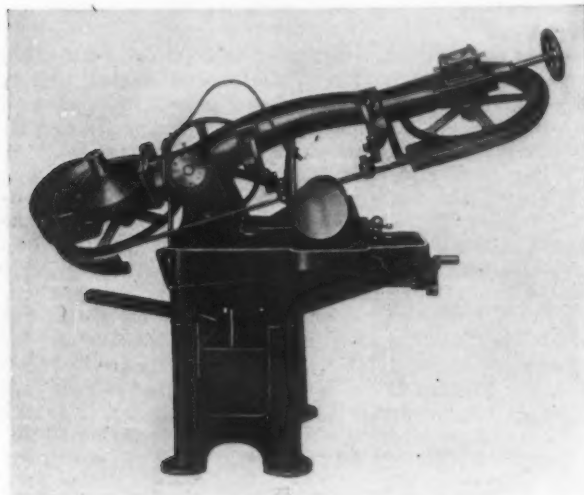
Combination Flange and Web Coping Attachment for Use With Buffalo Machines Having High Throat

other. Adjusting screws are provided for gaging the depth of cut to be taken, or for gaging the depth of notching in flanges. Aligning is said to be unnecessary when knives are replaced. Machined pockets into which the knives fit assure correct relative positions of the shearing edges without adjustment. In addition to the regular work for which the attachment is designed, special knives are available for notching 90 deg. or other angles. The knife holders are of steel castings, and the knives of tool steel. The guide pins are of ample size and bearing surface to prevent breakage.

### Distinctive Features Claimed for New Metal Cutting-Off Machine

A cutting-off machine known as the Milband which incorporates distinctive features is being marketed by the Henry G. Thompson & Son Co., New Haven. The machine is of the horizontal bandsaw type and its capacity ranges from thin-walled tubing to solid bars of annealed high-speed steel and other material up to 6 in. square.

The arrangement of the component parts of the machine may be noted from the illustration. The swinging frame carries the band wheels and is counter-



Speed, Accuracy of Cuts, Long Life of Saw Blade and Narrow Kerf are Features Claimed

balanced to eliminate gouging of the saw because of soft spots or thin sections. The feeding movement is gear driven through a rack and pinion and is positive.

It is definitely controlled, the rate of feed being determined and set according to the size and kind of material to be cut. The same bandsaw is said to cut thin-walled tubing with the same continuous movement as solid stock. Six changes of feed are provided, and a plate attached to the machine indicates the correct feeds and speeds for bars of various materials and sizes. A multi-speed countershaft permits of changing the speed of the saw to suit various kinds and sizes of material.

Lubricant is pumped to the cut from a tank within the base of the machine. The work-holding vise is double. The jaws are controlled independently and the material to be cut is held on both sides of the kerf, which is stressed as a feature permitting the cutting of disks or slabs  $\frac{3}{8}$  in. thick without injury to the band or allowing the cut to creep sidewise. The band is guided ahead and behind the cut by hardened steel rollers mounted upon ball bearings.

When starting a cut the arm of the machine is pulled down until the saw makes contact with the work. The operator then engages the feed clutch. The saw cuts through the material at a definite rate until the piece is cut, when the feed is disengaged automatically.

A special blade manufactured by the company is employed. The band is 12 ft. 11 in. long,  $\frac{3}{4}$  in. wide and 0.031 in. thick. The teeth are pitched five to the inch, and are set to make a kerf 0.050 in. wide. The band is safeguarded on the idle side and around the wheels by an aluminum guard. A band may be changed by one person without assistance.

The machine may be arranged for either belt or motor drive. The power required is 2 hp. The floor space occupied by the belt driven machine is 6 ft. by 3 ft. 8 in. The weight of the machine is 1050 lb.

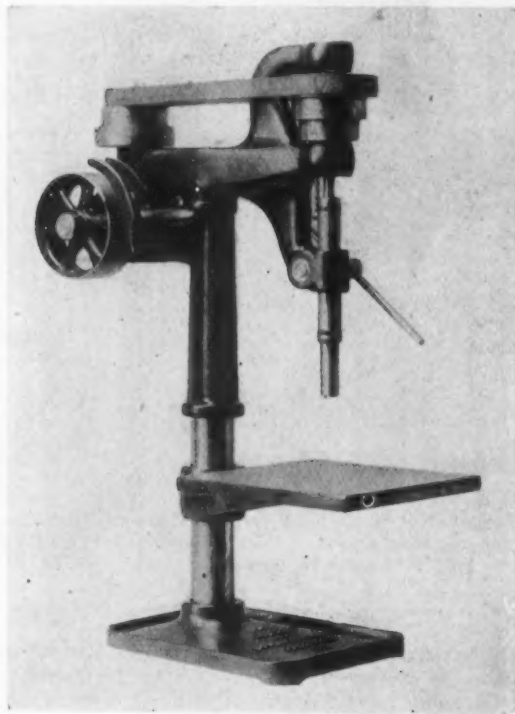
### Plain Bearing Sensitive Drill

A plain bearing sensitive drilling machine designated as the Edcort No. 2, and adapted for a variety of small work, has been placed on the market by the Edlund Machinery Co., Inc., Cortland, N. Y.

The machine may be arranged for belt or motor drive. The power is transmitted from the pulley shaft through two bevel gears and a vertical drive shaft to the rear three-step cone pulley, from which it is carried by a straight endless belt to the forward cone which drives the spindle. This arrangement is intended to eliminate the employment of a quarter-turn belt.

The spindle, which is of high-carbon steel, is turned and carefully ground to size. It is balanced carefully, and this, together with the balanced cone pulleys, is said to provide a machine of extreme sensitiveness, eliminating all vibration at high speed. A small oil reservoir is provided in the top of the spindle sleeve to eliminate the necessity for frequent oiling of the spindle. The spindle is counter balanced by a weight inside of the column of the machine and is provided with a ball thrust bearing at the lower end of the spindle sleeve. The latter is of steel, bronze bushed, and is reamed on the inside and ground on the outside.

The frame and gear case are cast in one piece to assure alinement. The drive pulley is 6 in. in diameter and the steps of the cone pulleys are  $3\frac{1}{4}$ , 4 and  $4\frac{1}{4}$  in.



The Machine May Be Arranged Also for Motor Drive

in diameter. Three speed changes are provided. There is an adjustable idler for taking up the slack in the belt. The table has a working surface of  $11\frac{1}{2} \times 11\frac{1}{2}$  in., may be raised or lowered on the column, and may also be swung around to permit of drilling nearer the edge. The maximum distance from the spindle nose to the table is 11 in. The vertical traverse of the spindle is 4 in. With the drive pulley at 600 r.p.m. spindle speeds of 1000, 1400 and 1800 r.p.m. may be obtained. The drill capacity is  $\frac{3}{8}$  in. The height of the machine over all is  $34\frac{1}{2}$  in. and the weight 125 lb.

The Youngstown Sheet & Tube Co. has blown out Jeannette blast furnace in its Brier Hill group at Youngstown for relining and repairs, leaving the company four active stacks of nine in the Youngstown district.



# New Sheet Bar and Hot Strip Mills

Otis Strip Mill Continuous from Furnace to Coilers,  
Without Use of Hot Bed—Electric Drive  
Throughout

BY FRED L. PRENTISS

COMPLETION of the erection and the placing in operation of a 24-in. sheet bar mill by the Otis Steel Co., Cleveland, in June was the last work of major importance in the carrying out of a building program inaugurated ten years ago when that company commenced the building of its Riverside works. In the latter part of 1923 the company placed in operation a 20-in. hot strip mill and a cold rolled strip mill plant and early this year an open-hearth steel plant and a 40-in. blooming mill.

With the acquisition a few years ago of the two blast furnaces and by-product coke plant of the Cleveland Furnace Co., the Otis Co.'s Riverside works is now a self-contained steel plant covering the processes from the ore to various finished lines. The units in addition to those mentioned above include a 30-in. sheet mill with eight stands, which was described in *THE IRON AGE*, Jan. 26, 1922, an 84-in. tandem plate mill and four 30-in. jobbing plate mills.

## New Hot Strip Mill

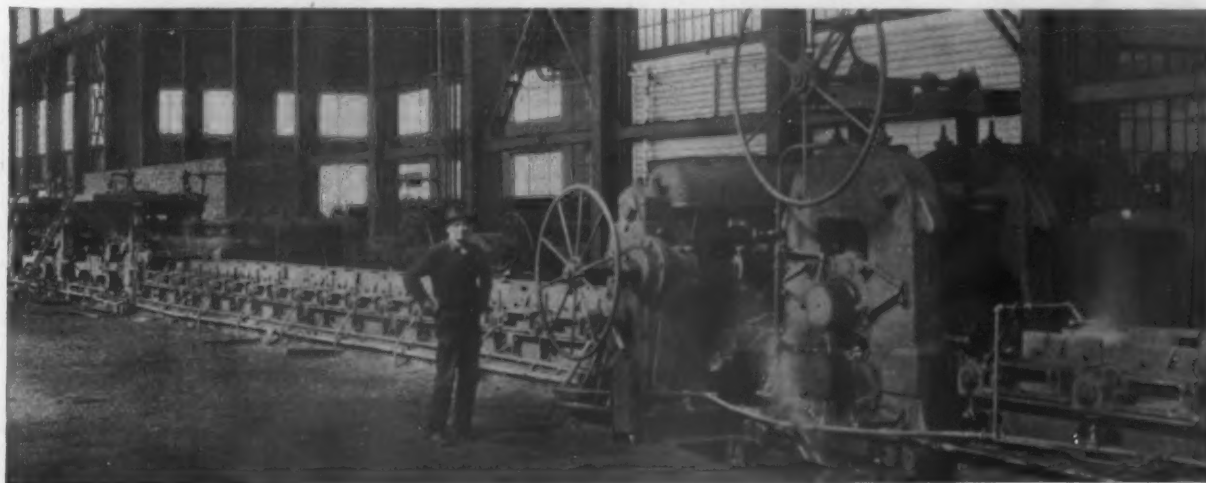
From the standpoint of equipment and arrangement, the hot strip mill is the most interesting of the new units. This is electrically driven throughout and is declared to be the first strip mill to be built that is strictly continuous in operation, some other mills of

late design being classified as semi-continuous. In the Otis plant the steel passes in a straight line from the heating furnaces through the roughing and finishing rolls to the winding reels, on which all the strip is coiled hot, entirely eliminating transfers and a hot bed. This departure, from the usual practice of delivering the strip from the finishing mill to the hot bed and later coiling it cold or partly cooled, results in a large saving in floor space as well as effecting various economies in handling. The coiling reels are of a new design and a conspicuous feature of the plant.

The hot mill is designed to roll strips from 6% to 24% in. wide in all gages common in hot mill practice. The widths rolled show the tendency toward the production of wider strip. The mill has a capacity of 20,000 tons per month.

The mill building is 600 ft. long and 75 ft. wide; on one side are two motor houses, one 40 x 160 ft. and the other 40 x 140 ft. The covered slab yard adjoining the heating furnace and hot mill building is 80 x 220 ft. This is served by a 10-ton Morgan crane which places the slabs either on the floor or on a standard type motor-driven pusher built by the United Engineering & Foundry Co.

A feature of the two heating furnaces is that each has a suspended roof over the combustion chamber to



Last Stand of the 20-In. Roughing Mill and Immediately Next to It (at left) the Second Stand of Vertical Edging Rolls. From the latter the strip moves in a straight line over the roller table to the finishing mill at extreme left



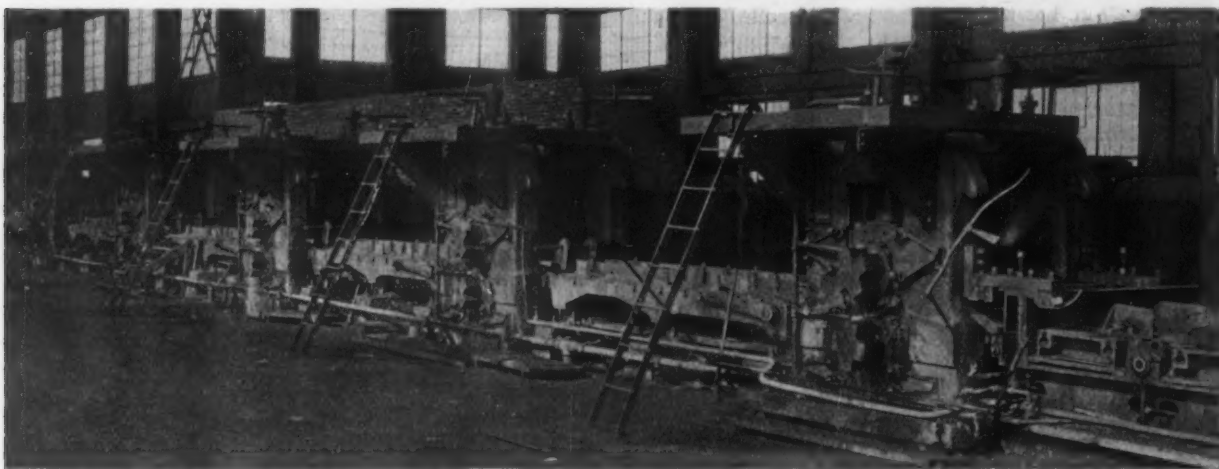
Gear Drives for Roughing Stands of 20-In. Hot Strip Mill

take care of the side wall expansion. The furnaces were built by Alex Laughlin & Co. and the suspended roof was supplied by the American Arch Co. Slabs are charged into the furnaces in lengths ranging from 30 in. to 11 ft., depending on the length of strip to be rolled. Consequently a shear is not needed in the table connecting the furnaces with the first roughing stand.

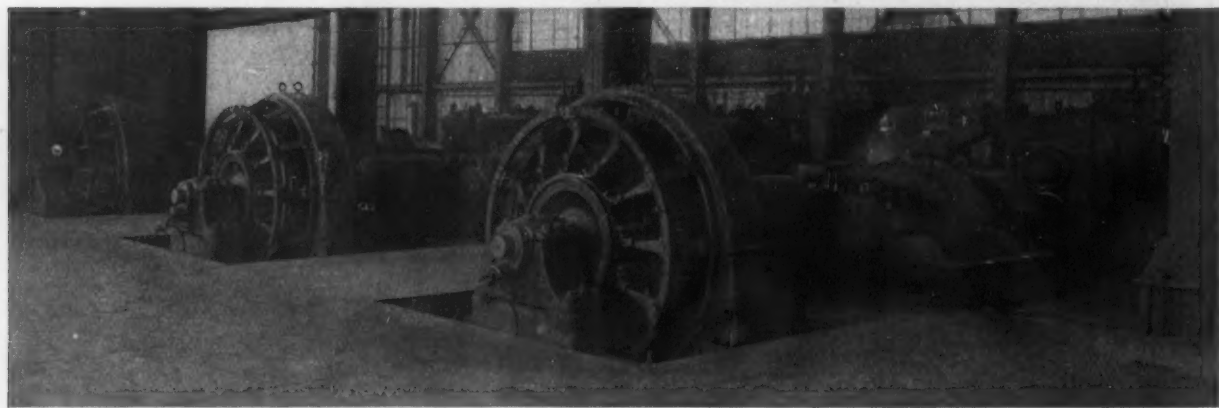
Seven stands of rolls in a continuous line comprise the 20-in. roughing mill. The first stand is a horizontal edger, the next two stands are flattening rolls, the fourth stand is a vertical edger, the fifth and sixth stands are flattening rolls and the seventh stand is a vertical edger. Five of the mill stands are driven from a common line shaft, but the two vertical edging rolls have individual motor drive. Although there may be two or three pieces in the roughing mill at a time, one piece is never in more than one pass at a time; conse-

about 6 ft. long, each holding three to ten coils, depending on the width of the strip. When an arm is loaded the wheel, electrically driven through a line shaft, gear and pinion, moves 60 deg. and automatically stops, bringing the next arm in position to take coils from its reel. The strip when coiled is handled from the wheels to a storage space by an overhead crane. From the storage the coils go directly to cars if no further operations are required. Cars are loaded on a depressed track that extends into the hot strip mill building on one side. The hot strip mill is served by a 25-ton Morgan crane and a 15-ton Alliance crane.

If the strip is to be straightened and cut to length, a crane carries the coils to roller levelers and shears located farther down the plant. There are two McKay roller levelers serving Mesta shears and one United Engineering & Foundry Co. roller leveler serving an



The Hot Strip Finishing Mill Consists of Six Stands of 20-In. Rolls. From the last stand the strip passes over a runout table to winding reels on which it is coiled hot, eliminating transfers and a hot bed



Three 1500-Hp. Motors of 280 to 420 R.p.m. Driving the First Three Finishing Stands of the 20-In. Hot Strip Mill. The motors are shunt wound and use 600-volt direct current

quently close speed control is not required for the roughing stands and there is no speed regulation.

From the last roughing stand the strip moves straight ahead on a roller table a distance of 75 ft. to the finishing mill, which is in line with the roughing mill and consists of six stands of 20-in. rolls, all flat passes. The stands are so arranged that one strip of steel may be in five passes at a time, but on the average it is in three or four passes.

Hot strip goes from the last pass of the finishing mill onto a roller runout table, from which it is fed through a trap door onto a winding reel located beneath the runout table. There are three of these winding reels and all the strip is hot coiled.

Coiled strip is ejected from the reel by hydraulically operated kickoff onto the arm of a cooling wheel, one of which serves each reel. These wheels have six arms

United shear. The mills, mill tables, gear drives, reels and cooling wheels were built by the United company. The mills are of standard design and have steel housings and cut steel gears.

Five roughing stands, including the horizontal edger, are driven by one 1800-hp. 6600-volt, 25-cycle, 3-phase, a.c. induction motor with a speed of approximately 490 r.p.m., through a reduction gear set to the line shaft and through beveled gears to the mill stands. The roll speed ranges from  $21\frac{1}{2}$  to  $62\frac{1}{2}$  r.p.m. Each of the two stands of vertical edging rolls is driven by a 100-hp., 230-volt, variable speed d.c. motor having a speed range of 600 to 700 r.p.m.

The finishing mill stands have individual motor drive. The first three are driven by 1500-hp., 280 to 420 r.p.m., 600-volt shunt wound d.c. motors and the last three stands have motors of a similar type, of



Passing from Last Finishing Mill Stand to the Run-out Table Shown, the Strip Is Fed to Winding Reels Under this Table, All Strip Being Hot Coiled. From the reel the coil is ejected to one of six arms of the electrically operated cooling wheels shown in the foreground



1800 hp. capacity and having a speed range of 115 to 230 r.p.m. The first three stands are driven through reduction gear sets and the last three stands are directly connected to the motors.

Three 1500-kw. synchronous rotary converters convert the 6600-volt a.c. power to 600 volts d.c. for driving the finishing mills. Rotary converters were selected instead of motor generator sets, for supplying this current to the finishing mill motors, because of the higher efficiency of the rotary converter and the smaller floor space that it requires. Current at 6600 volts is delivered to the plant from the central power plant, six high-tension lines supplying the various units.

The reels are driven individually by 50-hp., 500 to 1500 r.p.m., 230-volt variable speed motors. An interesting feature of the control of these motors is that they are synchronized directly with the control of the last finishing mill motor, so that, with any variation of speed of the last finishing mill, there is a corresponding variation in the speed of the reel motors, thus preventing any lapping or stretching of the strip between the finishing stand and the reel. Control of the electrical equipment for the roughing and finishing mills is from a centrally located operating pulpit at the side of the building, commanding a view of both mills. All the mill motors are controlled from master controllers and there are field rheostats for controlling the speed of the finishing mill motors. In the pulpit there is also an electric tachometer for each mill stand, to read the mill speed. Entire control of the winding reels and coiling wheels is from a separate pulpit overlooking the reels. The mill motors, rotary converters and

other electrical equipment were supplied by the General Electric Co.

The mills are provided with an entirely automatic lubricating system. Flooded stream lubrication is supplied to all bearings except the roll bearings, which are greased. The oiling system includes an overhead gravity tank for feeding the oil to the bearings by gravity pressure. From the bearings the oil is drained to a receiving tank beneath, where water and heavy solid matter are precipitated. A dual pump takes the oil from the precipitation tank to an oil filter for further clarification and from the filter it is pumped to the gravity tank for recirculation. The motor-driven pumps are set in operation by an automatic electric switch actuated by the rise and fall of the oil level in the overhead tank. This system, installed by the S. F. Bowser Co., Inc., has a capacity for circulating to the bearings 400 gal. of clear oil per hour. An interesting feature in connection with this installation is that in the piping system the use of T's and elbows has been avoided by bending the pipe. Pipe up to 2 in. in diameter in some cases is bent around columns and footings to a 2 to 3 ft. radius.

The pickling and annealing department, 90 x 720 ft., is an extension of the hot strip mill building. This is equipped with six 2-chamber single length side combustion pulverized coal fired annealing furnaces built by the George J. Hagan Co., and one 4-chamber single length Smallwood annealing furnace supplied by the American Industrial Furnace Co. This is hand fired with coal. The annealing boxes and bottoms are of cast steel of various types. The common practice

On the Side of the Runout Table, Opposite the Cooling Wheels, Showing the Drive for the Coiling Reels. The motors are synchronized with the motor of the last finishing mill stand, so that the speed of the reels varies with the speed of the mill



of charging the boxes into the furnaces on ball tracks, with an overhead crane, is followed.

Pickling equipment includes a Mesta 4-arm pickling machine, three wooden pickling tanks and two steel tanks, one for oil and one for lime solution. The tanks, 18 ft. long, 4 ft. wide and 5 ft. deep, are arranged in a row and are served by an electric monorail hoist which handles the coils in and out of the tanks on cradles. Other equipment in this department includes a Streine Tool & Mfg. Co. shear for cropping the ends of the strip and a recoiler built by the company for recoiling the strip before pickling, as loosening up of the coils is necessary, to permit the solution to come into contact with the entire surface. Three electric tractors handle the coils between the annealing and

12-in. by 150-hp., the 16-in. by 275-hp. and the 20-in. by 375-hp. variable speed Westinghouse motors. The mills have electric push button control on every stand, connected to the electrical control apparatus located on a balcony.

Other equipment in the cold rolling department includes two slitters, two straightening and cutting machines, an edging machine built by the Broden & Dailey Construction Co., two oiling machines built by the Otis Co. and a scrap baling machine and a roll grinder supplied by the Landis Machine Co. The building is served by a 10-ton electric traveling crane.

The cold rolled department is located in a commodious and exceptionally well lighted building, 110 x 720 ft., adjoining one side of the pickling and annealing



The Blooming Mill Is a Two-High 40-In. Reversing Mill with Hydraulic Manipulators and Motor-Driven Screw-Down

cold rolling departments. The annealing department is served by a 40-ton and a 10-ton electric traveling crane.

#### Cold Rolled Strip Department

The cold rolled strip mill plant is equipped for making strip in about the same range of widths as produced on the hot mill, or from 6 to 24½ in., in all thicknesses down to 0.002 in. and in all grades, degrees of hardness, finishes and tempers and either in coils or cut to length. Slitters are used for producing widths narrower than 6 in. The capacity of the cold rolled department is approximately 5000 tons per month.

The cold rolled strip mill plant has four 5-stand units, or twenty mills. Each unit consists of four tandem continuous stands for the roughing operations, located rather close together, and a finishing stand placed about 30 ft. from the last roughing stand. These are 10, 12, 16 and 20-in. mills. Coilers are located after the last tandem stand and after each finishing stand. Usually the strip is passed through the four tandem stands at a time, but for some finishes it goes through only two or three of these stands.

Three types of mills are used. The 16 and 20-in. mills were built by the Mesta Machine Co.; the 12-in. by the Waterbury Farrel Foundry & Machine Co. and the 10-in. mill by the Philadelphia Roll & Machine Co., the latter being the first installation of a new design of low type mill, described in THE IRON AGE, Aug. 30, 1923. The 10-in. stands are driven by 100-hp., the

department. The building is of brick, with ample window surface of factory ribbed glass, and with a modified type of monitor roof in which there are three rows of continuous sash. It has a wood block floor and gypsum roof. It is heated by hot water radiation.

#### Four 100-Ton Open-Hearth Furnaces

The open-hearth plant is provided with four 100-ton basic lined furnaces and was laid out with the view of extending the building later to provide room for additional furnaces. The furnaces were built by the company, with hearths 15 ft. 6 in. x 40 ft., bottoms of magnesite and side walls of silica brick. Each has five electrically operated doors. Reversing valves and also the dampers between the checkers and pipe flues, made by the Blaw-Knox Co., are motor operated. An interesting feature is that the only parts that are water cooled are the doors and frames, which were supplied by the Blaw-Knox Co. The backstays are of channel and I-beam construction. As a departure from the usual type of steel stack, the furnaces have radial red brick stacks, 170 ft. high and 7 ft. in diameter, built by the M. W. Kellogg Co.

Though at present oil fired, the furnaces are designed for the use of producer gas. Oil is delivered from cars into a 1,750,000-gal. storage tank, from which it is pumped into a circulating main from which the furnaces are fed, the fuel being preheated at the furnaces.





From the Blooming Mill Runout Table the Steel Passes to a Hydraulic Shear of Special Type. After shearing it is weighed and then discharged onto a slab conveyor to go to the shipping yard, or is carried in a straight line to the first roughing stand of the sheet bar mill

The open-hearth building is 163 x 390 ft. Because glass is quickly broken in an open-hearth plant, there are no glass windows except in a lean-to on the charging side. Sufficient openings have been provided on the sides of the building to provide good lighting. In this connection it might be mentioned that the soaking pit, blooming and bar mill, and hot strip mill buildings have 10 ft. of open space on both sides from the ground up, to assure good ventilation in warm weather, these open spaces being closed in winter.

The charging floor is located 20 ft. above the ground level. The furnaces are served by a 100-ton Alliance crane and a 10-ton Morgan charging machine. Hot and cold metal are charged direct to the furnaces, the former being brought to the open-hearth plant from the blast furnaces in 60-ton Pollock ladle cars. Scrap brought directly into the plant on railroad cars is reloaded from the cars into charging boxes, carried by buggies supplied by the Wellman-Seaver-Morgan Co.

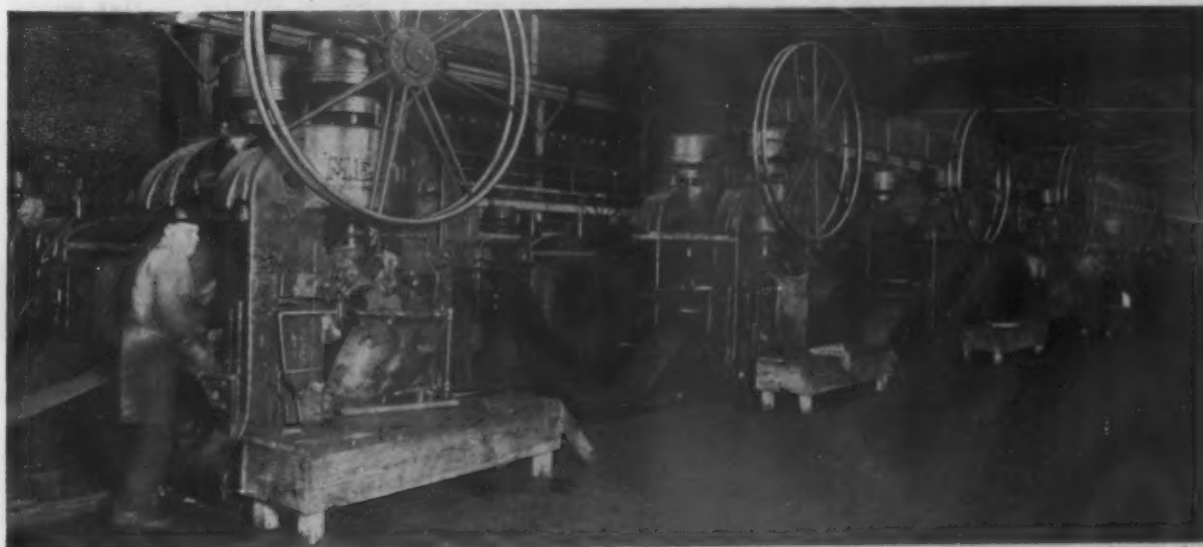
On the pouring side is a 175-ton Alliance electric traveling crane and each furnace is served by a 7½-ton jib crane supplied by the Pennsylvania Engineering Works. The pouring platform is 315 ft. long, extend-

ing to next to the last building column at each end. Steel is tapped into a 120-ton ladle supplied by the Treadwell Construction Co. The slag is handled in a 260-cu. ft. ladle, or the same size as is used for handling the blast furnace slag, so that the cars used for dumping the open-hearth and blast furnace slag are interchangeable. The ingot molds, 22 x 24 in. and 24 x 28 in., are of cast iron and were supplied by the Valley Mold & Iron Corporation. The ingot cars, built by the Mackintosh-Hemphill Co., are of standard gage and are hauled to the soaking pit by a plant locomotive.

#### Soaking Pits and Blooming Mill

A separate stripper building is not provided. The ingots are stripped of their molds by a 150-ton electrically operated stripper built by the Alliance Machine Co. and located in the first two bays of the soaking pit and stripper building, which is 90 x 200 ft. The blooming and bar mill building, 90 x 720 ft., is connected to the south end of the soaking pit building.

There are six one-hole soaking pits 6 ft. 6 in. x 14 ft. 3 in., each pit holding twelve ingots. This is a return to the practice common years ago, which was



Four Tandem Stands of the 20-In. Mill, in the Cold Rolling Department

followed by the substitution of four-hole pits, although the use of one-hole pits has remained quite general for soaking slab ingots. The pit furnaces, fired by coke oven gas, have electrically operated valves and covers, and are charged with a 10-ton Alliance low-type soaking pit crane.

The ingot chariot track leads directly from the front of the soaking pits to the blooming mill—a standard design two-high 40-in. reversing mill with hydraulic manipulators and motor-driven screw-down. The sheet bar mill takes the steel direct from the blooming mill, but space is left between the two mills for a reheating furnace, if it is decided later to install such a furnace. The blooming mill runway table delivers the steel to a hydraulically operated shear having three 38-in. plungers and two 12-in. pull-backs. After shearing, the material passes to a Fairbanks scale. If the steel is not to be further reduced after leaving the blooming mill the slabs and blooms, after being weighed, are discharged onto a slab conveyor which delivers them to the shipping yard at the side of the building. Otherwise they pass onto the sheet bar mills.

#### New Sheet Bar Mill

The sheet bar mill is a three-stand 24-in. mill with two 3-high roughing stands and one 2-high finishing stand, the three stands being located side by side. It is driven through a gear reduction set at approximately 100 r.p.m. The material passes forward and backward through the two roughing stands and after the last roughing pass is discharged over a gravity transfer chute onto the approach table of the finishing stand. A set of pinch rollers is located on the approach side of this stand. From the finishing stand delivery table the sheet bars are delivered to the hot bed, 110 x 140 ft. A table on the opposite side of the hot bed in the shipping yard carries the bars back to the shear, which cuts them to length. From this shear they are delivered to the bar piler, from which they are handled by the shipping yard crane, being either put on cars or into stock.

The blooming and sheet bar mills, which are of unusually heavy construction, were built by the Mackintosh-Hemphill Co., which also supplied the bar mill

gear reduction set, mill tables, ingot chariot, hot bed and shear. The tables have cast iron girders and ring oil bearings. All table gears have cut teeth and run in oil. Two motor-operated centrifugal pumps, each with a capacity of 1500 gal. per min. and with 550 lb. working pressure, supply the hydraulic system for operating the blooming mill manipulators and shears. The pumps were built by the Midwest Pump Co. Other equipment includes a 42-in. roll lathe built by the United Engineering & Foundry Co.

The blooming mill is driven by a 6500-hp. reversing motor having 1,500,000 ft.-lb. of torque, 50 to 120 r.p.m., 600 volts. The motor is driven by a three-unit, flywheel, motor-generator set consisting of a 3750-hp., 375 r.p.m., 6600-volt, 25-cycle motor driving two 2700-kw. 375 r.p.m., 600-volt generators. There is a 50-ton flywheel on the motor-generator set. Slip regulator control is provided. To reduce the number of spare parts carried, the bar mill motor is a duplicate of the 3750-hp. motor that drives the blooming mill motor-generator set. This motor has standard magnetic control consisting of primary oil immersed reversed contactors and secondary magnetic panel with cast grid resistor. Practically all the table and mill motors are of the open mill type and it is stated that this is the first steel plant in the country to use open-type motors. This design was selected because it permits easier and more thorough inspection, as well as making repairs without dismantling the motor.

In addition to the other units, the company has built a new boiler plant at its blast furnace plant, which is equipped with three 835-hp. Stirling watertube boilers and a 10,000-kw. turbo-generator. It also has built another pulverized coal plant of the Quigley type for use as an auxiliary fuel supply for units usually supplied with blast furnace gas.

All the construction work in the new plant units was done by the Otis company under direction of its engineering department, with the exception of the erection of the buildings, which were put up by the American Bridge Co. The character of the site necessitated a great deal of piling under the buildings and mills, which in some places was driven down to a depth of 38 ft. by the Raymond Concrete Pile Co.

### More Iron and Steel Forgings Produced

Iron and steel forgings, not including those produced in steel works and rolling mills, amounted in 1923 to \$178,951,349 from 233 establishments, an increase of 115 per cent over the \$83,151,126 produced in 240 establishments in 1921. The number of wage earners increased from 16,740 to 27,409 and their wages from \$20,635,787 to \$40,180,433. The average earnings per wage earner advanced from \$1,233 in 1921 to \$1,466 in 1923. The value added by manufacture increased from \$38,814,409 to \$86,140,523. The horsepower used in 1923 was 138,007, while the coal consumed amounted to 610,191 net tons.

### Spotting Charges Not Unreasonable

WASHINGTON, Oct. 28.—Dismissing the complaint of the Jones & Laughlin Ore Co., and many other large ore mining interests, the Interstate Commerce Commission last week held that stock-pile spotting charges on iron ore ranges in Minnesota, Michigan and Wisconsin, and rates on iron ore, in carloads, to upper docks during the period 1918-1921, inclusive, were not unreasonable or otherwise unlawful. The proceeding involved an action in which steel and ore mining interests sought reparations on account of charges made by the Chicago, Milwaukee & St. Paul and other railroads for the use of locomotives and crews for spotting cars in the loading of iron ore from stock piles of shafts.

Negotiations between the interested carriers and complainants resulted in a discontinuance on March 15 and July 1, 1921, of the separate charge. The commission, however, held that the charge was neither unreasonable nor unlawful.

### Improvements at Upson Furnace

Extensive improvements are being made in the Upson blast furnace and steel plant of the Bourne-Fuller Co., Cleveland. During the relining of the furnace, which is about completed, a skip hoist and ore and coke bins have been built and one battery of five soaking pits has been added to the steel plant. The soaking pit capacity has been increased fifty-four to sixty ingots. The company will shortly start to rebuild its bolt and nut works. Several modern type factory buildings will be erected to replace the present plant, some of the buildings of which are quite old. The first unit, contracts for which will be placed shortly, will be a four-story steel and concrete building, 70 x 170 ft. Other units will be added later and when all completed the bolt and nut works will have a floor space of 400,000 sq. ft.

### Increased Production of Pumps

Production of both hand and steam pumps showed a decided increase between 1921 and 1923, according to figures of the Census Bureau. Hand pumps advanced from a production of \$22,723,412 to \$35,706,816, while steam pumps increased from \$35,740,069 to \$38,958,557. Other power pumps at the same time increased from \$11,498,932 to \$18,262,954, making the total production of 221 establishments in 1921 \$69,962,413, while 229 establishments in 1923 turned out pumps valued at \$92,928,327. The number of wage earners increased from 12,186 to 14,550 and their wages from \$13,969,531 to \$19,990,603. The horsepower used in manufacturing in 1923 was 38,896 and the coal consumed 84,789 net tons.



# Optimism at Implement Convention

## New Era of Power Farming Opens Opportunities to Agricultural Machinery Makers—Problem of Labor in Relation to Immigration Also Discussed

GREATER confidence regarding the future of the agricultural implement industry and cautious optimism with respect to the immediate business outlook were voiced both in public utterances and in informal conversation at the thirty-first annual convention of the National Association of Farm Equipment Manufacturers held at the Congress Hotel, Chicago, Oct. 22, 23 and 24. An address on the "Future of Our Industry," by George A. Ranney, vice-president and treasurer, International Harvester Co., Chicago, was a leading feature of the program, furnishing convincing evidence that the heavy gloom which has hung over farm implement manufacturers for so long is now being dispelled and that business prospects for the years to come are assuming a promising aspect.

A new era in agriculture, the era of power farming, made possible by the internal combustion engine, has only just begun, bringing with it great new opportunities for the implement industry. The automobile, so frequently condemned because of its supposed harmful effects on the agricultural equipment industry, will prove in the long run, in the opinion of Mr. Ranney, a benefit rather than a detriment. Unquestionably, he said, the automobile has contributed enormously to the contentment of the farmer and has contributed substantially to his education in the direction of power farming. It is an easy step from owning and operating an automobile to owning and operating a tractor.

In the course of his remarks, Mr. Ranney made a number of specific prophecies which were wholly optimistic. He said:

"I predict that whatever else may change, eating will not go out of fashion. A generation hence, men will still be getting, or trying to get, their three square meals a day, and the material for these meals will chiefly come from the field and the orchard, from the dairy barn, the feed lot, the pig pen and the hen house.

"I predict, in defiance of anything you may hear from Detroit, that cows still will be giving milk 30 years from now, but that comparatively few of them will be milked by hand.

"I predict that wheat will still be grown, but it will be harvested by simplified power-propelled machines and hauled by some form of automotive vehicle—that the farm wagon will have disappeared from the rural roads just as the horse and buggy have already vanished.

"I predict that corn will still be raised, and perhaps in much greater relative quantities than now, but that power-drawn cultivators and harvesters will very largely supplant the present horse-drawn corn tools.

"I predict that cotton, freed from the boll weevil, will still pour a stream of wealth into the South, but that the human cotton picker will be supplanted by power-driven machines.

"I predict that farmers will still live on their land and that their homes will contain every modern convenience available at the time to the dwellers in cities.

"I predict that farmers' sons will still marry farmers' daughters and raise families, but that the farmer's wife will cook by electricity, will have mechanical or electric power to do the back-breaking hand labor of today's farm housekeeping, and that the farmer's children will be carried swiftly to and from the rural schools in comfortable motor buses over smooth highways and byways.

"I accept the forecast of 150,000,000 in population by 1954 and I predict that the food demands of that larger population will have brought a largely increased acreage in farm lands and a largely increased demand for well-designed farm implements.

"I predict that within the generation to come the farmer will have been put on a permanent basis of equality as to his compensation with all other industry and labor.

"I predict that the farm implement manufacturer who does not keep pace with the development of power on the farms will drop by the wayside.

"I predict that the manufacturer who invests his capital freely in better labor-saving devices and equipment for his factory in order that he may produce better labor-saving equipment for the farm will achieve a success corresponding with the advancing success of agriculture."

### Necessity of Foreign Trade

The necessity for foreign trade was also emphasized by the speaker. He said, in part:

"The foreign market for farm implements is a big market, and it will be bigger. Remember that the world's remaining great areas of unbroken or undercultivated land are in other countries than our own. Remember, too, that the world's population and its demand for foodstuffs will increase in something akin to the ratio in the United States. And do not fail to remember that the foreign market for farm implements is now and always has been an American market. Let us try to keep it so.

"The overcapacity of American farm implement factories is very great when you stack it up against the requirements of the American trade. If we are to have 90 per cent or even 80 per cent operation of these plants, it is obvious that a substantial part of their output must be sold abroad. I do not mean to discourage but only to warn you when I predict that any expansion of the export trade will be in the face of steadily growing competition from overseas."

### Restriction on Immigration Accentuates Need for Farm Equipment

Labor and Immigration was the subject of an address by William Black, president B. F. Avery & Sons, Louisville, Ky. Labor is the one great cost element which has not been deflated, according to Mr. Black. Whereas commodities have advanced an average of 44 per cent since 1913, labor rates have gone up 111 per cent. In commenting on the immigration law of 1924, he asserted that the restriction of immigration to an extent far beyond what has ever heretofore been attempted will create serious problems. Wages will fluctuate more rapidly with the rise and fall of industrial activities and the effects on our commerce will in due time be serious, because costs of production based on high wage rates will make it more difficult to compete with the European exporter with low wage rates and low costs. We cannot keep all of our labor busy in providing for our own needs; there must be an export outlet, and if this is greatly curtailed, there will eventually necessarily be a surplus of labor and low wages in this country in spite of restricted immigration. However, before this wage adjustment will have taken place, we will have lost much of our export trade, and once having lost it, it will be hard to recover. We do not need wages as low as those prevailing in Europe, we would not want them, but there is a limit beyond which the export manufacturer cannot go. It would be much better if a provision were made for such immigration as would provide a greater supply of common labor than is now possible under the 1924 law. The new immigrants from England, Germany and Scandinavia will not be seeking laboring jobs.

The question we have to answer is from what source

we will draw our labor when we arrive at the next period of general industrial activity. In the opinion of Mr. Black, it will come from the farms. The farmers are unable to hold their men against the lure of high wages and white lights. Likewise the colored population will become more evenly distributed between the North and the South, because the negroes will be attracted to the industrial centers of the North.

This shifting of labor will mean a new responsibility for the implement manufacturer: that of supplying farm machinery which will enable a small portion of our population to remain on the farms and feed an ever-increasing number of non-producers of food in the towns and cities.

Another factor which may affect the labor supply is the proposed twentieth amendment to the Constitution which would give the Federal Government the right to prohibit young men and women from engaging in any labor until they are 18 years of age. Such a measure, in the opinion of the speaker, would have bad

effects because it would encourage habits of idleness at a time when the youthful mind is most impressionable and should be taught to become useful to the community.

He suggests that perhaps support of the proposed amendment by the American Federation of Labor is accounted for by the fact that from 16 to 18 years is the apprentice age and the enforcement of legal restrictions against working during that period would make it easier to control the number of apprentices. The amendment would also constitute another encroachment by the Federal Government upon the rights of the States.

Finley P. Mount, Chicago, of the Advance-Rumely Co., Laporte, Ind., was elected president for the coming year, succeeding H. J. Hirshheimer, La Crosse Plow Co., La Crosse, Wis. E. J. Gittins, J. I. Case Threshing Machine Co., Racine, Wis., was elected executive chairman to succeed Mr. Mount. H. J. Sarnett continues as secretary, with headquarters at Chicago.

## American Society of Mechanical Engineers Announces Program for Annual Meeting

Engineering problems of the machine shop are to hold a prominent place on the 3-day technical program of the American Society of Mechanical Engineers, to be held in the Engineering Societies Building, New York, Dec. 2, 3 and 4. While the program is well balanced in that it touches on all phases of mechanical engineering, it is particularly noteworthy in the fact that there are several strong sessions with papers of importance and value to those interested in the engineering problems of the machine shop. The tentative list of sessions and papers follows:

### Tuesday, Dec. 2, 9:30 a. m.

**Oil Handling and Storing**—(Under auspices of Materials Handling Division) "Storage and Handling of Fuel Oil in Industrial Plants," by C. G. Sheffield and H. H. Fleming; "Handling Oil from Storage to Furnace," by John R. Battle.

**Research in Machine Design and Operation**—(Under auspices of Research Committee on Cutting and Forming of Metals and Machine Shop Practice Division) "Various Methods of Measuring Hardness," by J. O. Keller; "Progress Report of Special Research Committee on Metal Springs."

**Textiles**—(Under auspices of Textile Division) "Development of the Spinning Frame from 1738 to 1924," by R. E. Naumburg; "Engineer's Field in Industrial Economics," by Eugene Szepesi.

**General**—"Strength and Proportions of Wheels, Wheel Centers and Hubs," by R. Eksergian; "An Experimental Determination of the Coefficient of Discharge of a Flow-Measuring Nozzle for Air," by A. J. Nicholas and J. E. Nicholas; "Turbine Designer's Wind Tunnel," by Loring H. Wirt.

### Tuesday, 2 p. m.

**Joint Session with American Society of Refrigerating Engineers**—"Flow of Fluids," by W. H. McAdam; "A Determination of the Law Governing the Difference Between Observed and Theoretical Temperature at Which a Liquid Evaporates into Another Gas," by W. H. Carrier and D. C. Lindsay.

**Machine Shop Practice**—(Under auspices of Machine Shop

Practice Division) "Effect of Inaccuracies in Gear Teeth," by L. J. Franklin and Charles H. Smith; "Mechanical Springs," by Joseph K. Wood; "Ruling Line Standards by the Application of Light Interference and End Measuring Machine upon Which They Are Used," by C. G. Peters and H. B. Lewis.

**Turbo Locomotives**—(Under auspices of Railroad Division) "Zoelly Turbine-Driven Locomotive," by Henry Zoelly.

**Lecture (4.30 p. m.)**—"Petroleum Situation in the United States," by Julian D. Sears.

### Tuesday Evening

Presidential Address and Reception.

### Wednesday, Dec. 3, 9:30 a. m.

**Oil Burning**—(Under auspices of Fuels and Power Divisions) "Fuel Oil Burning in United States Navy," by Lieut.-Com. H. G. Donald; "Oil Burning in Central Station Service," by N. E. Lewis; "Hazards of Industrial Oil Burning," by H. E. Newell.

**Lubrication**—(Under auspices of Machine Shop Practice Division and Special Research Committee on Lubrication) "An Investigation of the Critical Bearing Pressures Causing Rupture in Lubricating Oil Films," by Lieut.-Com. L. N. Linsley; "High-Pressure-Bearing Research," by Louis Illmer; "A Graphical Study of Journal Lubrication," by H. A. S. Howarth.

**National Defense**—(Under auspices of National Defense Division) "Engineering of National Defense," by Assistant Secretary of War Dwight F. Davis; "Some Problems in the Design of Ordnance," by Major J. B. Rose; "X-Ray Examination of Metals at the Watertown Arsenal," by Col. T. C. Dickson; "Shock-Resisting Properties of Different Compositions of Steel at Various Temperatures," by F. C. Langenberg.

**Mechanical Design for Safety**—(Under auspices of A. S. M. E. Committee on Safety Codes and American Society of Safety Engineers) "A Place for Safety," by L. A. DeBlois; "Hazards of Pulverized-Fuel Systems," by H. E. Newell and R. Palm; "Accident Prevention in Oxy-Hydrogen Plants," by C. C. Myers.

### Thursday, Dec. 4, 9:30 a. m.

**Steam Power**—(Under auspices of Power Division) "Water Treatment for Continuous Steam Production," by R. E. Hall; "Increase in Thermal Efficiency Due to Reuperheating in Steam Turbines," by W. E. Blowney and G. B. Warren; "Review of Recent Applications of Powdered Coal to Steam Boilers," by H. Kreislinger; "Recent Developments in the Burning of Anthracite Coal," by W. A. Shoudy and R. C. Denny.

**Management**—(Under auspices of Management Division and Taylor Society) "Re-presentation of Frederick W. Taylor's Paper on Shop Management," by Morris Llewellyn Cooke; "Development of a Modern Hosiery Plant," by S. E. Thompson and H. T. Rollins.

**Aeronautics**—(Under auspices of Aeronautic Division) "Aerial Surveying Equipment," by E. Robinson; "An Introduction to the Helicopter," by Alexander Klemlin.

### Thursday, 2 p. m.

**Oil and Gas Power**—(Under auspices of Oil and Gas Power Division) "Solid-Injection Oil Engines," by R. Hildebrand; "Double-Acting Oil Engine," by C. E. Lucke; "Gas Turbines," by L. S. Marks and M. Danilov.

**Management**—(Under auspices of Management and Machine Shop Practice Divisions and Taylor Society) "Production Control," by George D. Babcock; "Design, Manufacture and Production Control of a Standard Machine," by R. E. Flanders.

**Hydraulic**—(Under auspices of Power Division) "Methods of Economic Design of Penstocks," by H. L. Doolittle; "Study of Draft-Tube Design," by Robert Angus.

**Lecture (4.30 p. m.)**—"High Pressures," by P. W. Bridgman.

The Walworth Mfg. Co., Boston, fittings, wrenches, etc., is operating at approximately 60 per cent of capacity. Present plans call for an increase to 80 per cent in December. During the summer, business, as usual, fell off sharply, but around the middle of August began to pick up, and since then has shown steady improvement.

## COMING MEETINGS

### October

**American Welding Society.** Oct. 30 and 31. Fall meeting at Hotel Winton, Cleveland. Miss M. M. Kelly, 33 West Thirty-ninth Street, New York, secretary.

### November

**American Institute of Steel Construction.** Nov. 13, 14, 15. Annual convention, French Lick Springs, French Lick, Ind. Charles F. Abbott, 350 Madison Avenue, New York, executive director.

**Society of Naval Architects and Marine Engineers.** Nov. 13 and 14. Annual convention, Engineering Societies Building, New York. Daniel H. Cox, 33 West Thirty-ninth Street, New York, secretary.

**National Founders Association.** Nov. 19 and 20. Annual convention, Hotel Astor, New York. J. M. Taylor, 29 South La Salle Street, Chicago, secretary.



# Essentials of Budget Making Discussed

Considerations Underlying Budgetary Control Reviewed at  
Management Week Meetings—Form of Budget Varies  
with Use—Business Cycle a Basic Factor

**B**UDGETING for better management was the topic discussed at meetings held in more than 65 cities during management week, Oct. 20 to 25. Management week has been observed each year since 1922. An abstract of the addresses and papers delivered at the meetings held in New York Oct. 21 and in Chicago Oct. 22 follow. In both cities the program was under the auspices of the American Society of Mechanical Engineers, the Taylor Society, the American Management Association, the Society of Industrial Engineers and the National Association of Cost Accountants.

Methods of preparing budgets were outlined by John H. Williams, consulting engineer, New York, in an instructive address at the New York management week meeting, held at the Engineers' Societies Building.

The subject of the meeting was "Budgeting for Business Control," and George E. Roberts, vice-president, National City Bank, New York, presided. Ernest F. DuBrul, general manager, National Machine Tool Builders' Association, also addressed the meeting, his subject being "Economics and Budgets."

In making a budget, said Mr. Williams, the first step is to determine for what purpose it is to be used, the form of the budget varying with the different uses. He divided the uses into three broad classes: Appropriation and control, policy determination, and coordination and control. The actual process of making budgets of each of these types was described in detail, Mr. Williams drawing on his experience in this work. The forms used in connection with each budget were shown by lantern slides.

Discussing the budget for policy determination, Mr. Williams said that the accounting classification must be made with great care and must be studied, otherwise the budget will defeat the purpose for which it is intended. Unless you base the budget on a carefully prepared classification that represents the management and in subdivisions in which the books are going to be kept, you have nothing, he said, but an old-fashioned rule-of-thumb method. The principal criticism of budgets was thought to be due to the lack, until recently, of a means of providing flexibility to the budget. The educational value of budget making to operating executives was particularly stressed.

## Consideration of Business Cycle Essential

Consideration of the business cycle in making budgets was emphasized as essential by E. F. DuBrul. The business cycle's vagaries are caused, he said, by a great deal of bad planning, and its fluctuations will be reduced only by better planning based on good information rather than on mere guesses, hunches and "hokum."

The questions of the business cycle were characterized as complex and to need a great deal of solving. "The best solving," he said, "is going to be done by the people who bump into the pestiferous thing every day of their business lives. Where they use brains, mixed with planning and budgeting and statistics and other little things, they get the answer. The trouble is that

not enough of those business men are getting on the job, in taking the cycle apart and finding out how it works, and what makes the thing tick."

The impossibility of successful planning and budgeting without knowing something about forecasting future business was emphasized and in this connection Mr. DuBrul said, "you cannot forecast without statistics, so I urge a sympathetic attitude toward the fellows who want to educate business in the use of statistics." Budgeting, he said, is easiest in industries that are awake to the value of good statistics. Budgets based on enthusiastic salesmen's hopes without any more foundation than guesses and hunches do not check out nearly so well as those based on a study of business trends.

"To get the real trends of an industry you need something more than a Harvard curve, or a Babson chart, or a Brookmire forecasting line," he said. "The general economic services are all very well in their way, but they give you mere averages. Averages conceal facts. A man might easily drown crossing a stream whose average depth is two feet. Statistics of an industry might show up a few holes that are not disclosed in the trend of bank debits averaged with commodity prices. The industry's demand might lead this average up and down, or might lag it, or might lag on the rise and lead on the fall, as the machine tool industry does.

"Budgeting ahead of a business index is a lot harder than budgeting behind one; so it helps a lot to know where to find indexes that lead your industry's orders both up and down.

"It is one job of a trade association to dig out such indexes for its own industry, and then to teach its members how to use them. We are getting very proud of the job we have done along that line for the machine tool industry. We had to find a way to quickly bring into graphic relationship many statistical series of widely differing amplitudes of fluctuation. Our office force being small, we could not take the time it would have required to go through all the long processes involved in the Harvard method of reducing these series to cycle figures. We needed something that would give us comparable charts with much less labor. Necessity mothered a statistical invention of extreme simplicity and effectiveness. Then we had to hunt through all available series of statistics, plotting many of them by our method to see which served our purpose best.

"We finally found three that reacted very well indeed in advance of our demand. By taking these in connection with several others that confirm our three main indexes at varying stages of a cycle we are in position to show the machine tool industry what is coming with a reasonable degree of confidence."

Budgeting was defined by Mr. DuBrul as a process of laying out prospective income and expense, after a careful analysis, and reducing that to analytic figures. "That," he said, "is the progressive way to do it. The super-progressive way is to reduce the budget figures to charts that give graphic pictures of anticipations and realizations."

## Addresses on Budgetary Control and Other Problems at Chicago Meeting

**B**UDGETARY control was a leading topic of discussion in the third annual observance of management week at Chicago, which took the form of afternoon and evening meetings on Wednesday, Oct. 22. The afternoon meeting was held in the assembly hall of the

Western Society of Engineers, Monadnock Block, and the dinner meeting in the evening at the City Club, Chicago.

"Coordination of Departmental Budgets" was the subject of an address by J. O. McKinsey, professor of

accounting, University of Chicago, and member of the firm of Fraser & Torbet. Enthusiasm for budgetary control, in his opinion, is going too far, largely because of a misconception of its possibilities and a misunderstanding of its proper application. The preparation of budgets is not merely a matter of compiling statistical data or filling out forms. A coordination of the sales, financial and production departments by means of budgets is more than an accounting problem and involves many considerations beyond the mere computation of what the heads of an organization think can be sold and produced in a given period. These estimates mean little unless the policies of the company are clearly defined. The volume of sales and of production are limited by the prices the company is willing to name, the costs it is willing to incur and the profits it aims to make. In many cases a company has set out to sell a certain quantity of goods only to find that to achieve that end it was forced to cut prices at the expense of profits.

It is well to think of a budget as a picture of the policies of a business. It is for that reason that budgets, after they are made up, should be coordinated by a budget committee headed by the directing executive of the company. It is he and he alone who can reconcile the proposed budget with the policies of the company.

Successful budgets can be prepared only with due consideration of seasonal and cycle fluctuations in business. The volume of sales may be normally very irregular. This immediately raises the question whether attempts should be made to smooth out the curve of demand to permit steadier production or how much the company will pile up inventory and how much it will allow output to fluctuate. One way of reducing the irregularities in demand has been through the sale of a variety of products. The classical illustration is the coal and ice business, the peak of ice demand occurring at a time when the demand for coal is at its lowest ebb.

Budgetary control has its distinct limitations. At best it is merely an administrative device and cannot take the place of management. Once a budget has been made up it devolves upon the management to carry out the program adopted. Budgets, furthermore, should not be rigid, or they will break down in operation. The primary object of any business is to make money. If an unforeseen condition arises, a given organization must adjust itself to it. A budget, however, should not be altered hastily without due reference to the committee by which it was originally approved.

The Relation of the Production Department to Budgetary Control, a paper by Frederick J. Knoepfel, resident partner Scovell, Wellington & Co., Chicago, was read by F. E. Gooding. It was pointed out that developments principally in the production department of manufacturing plants have paved the way for budgetary control as now understood. One of the first steps toward budgetary control was the ascertainment of the producing capacity of a plant. A second step was the scheduling and planning ahead of output on the basis of sales.

#### Production Department the Hub of Budgetary Control

The production department is the hub of budgetary control. It is of primary importance that the production department should know accurately how much in feet, gallons or pounds of this it takes to manufacture so much in feet, gallons or pounds of that, including scrap and waste. This information is imperative before an accurate estimate can be made of the outgo in labor, material and overhead as compared with the income from sales.

The Problem of Administration was discussed by George D. Babcock, manufacturing executive, Holt Mfg. Co., Peoria, Ill. An administrator, he said, must be at the head or apex of management, be final authority in matters pertaining to all activities, and must be a coordinator and then a commander of the organization. His activities may be carried on by personal contact with the members of his staff, or all of his major personnel, by conference, by direct instruction, written or oral; or by standardized relationships, poli-

cies and practices, so that repetition or routine may be carried out efficiently and without conflict.

Where divisions of a business or industry are not closely related the administrator is chiefly active in policies, but in an industrial enterprise where all divisions are interested in one product coordination must be effected and commands given. For the successful conduct of an enterprise with a complex product, someone, somewhere, with or without authority, must have the duty to coordinate and practice administration.

Merchandising a variety of articles not closely related in kind or use, manufacturing a variety of parts which are not from a common material, but which are distributed unassembled, are not complex products in the sense of administration, but the merchandising of complex installations, whether domestic or engineering, or the manufacture of complex assemblies or finished products require a coordinating administrator. As the quantity of any article increases, the administration for that article decreases, for there is less variety per unit of equipment or operator.

#### Coordinating Plant Layout with Production

Coordinating Plant Layout with Production was the subject of a paper by C. G. Stoll, works engineer, Hawthorne plant, Western Electric Co. The essence of successful operation of any industrial establishment, he asserted, is contained in the maxim: "Plan your work, then work your plan." Coordinating plant layout with production is primarily a problem of making an original plan that is sufficiently comprehensive to include the broad general solution of all the problems involved; that is sufficiently flexible to adapt itself to changeable conditions without altering its essential character, and that looks far enough into the future to prevent any possibility of costly shortsighted use of the factory's capital and facilities.

In laying out the Hawthorne works the Western Electric Co. adhered to standard types of buildings, bearing in mind the ever-present possibility of radical changes in work. A few exceptions to this rule were made where the type of product necessitated special building construction. The primary manufacturing operations are grouped into departments by class of work or operation and not by class of product. Thus there are punch press departments, screw machine departments, a milling department, a drilling department, etc. The advantages of this method of dividing manufacturing work are that it minimizes investment by avoiding duplication, increases machine activity, provides the greatest flexibility of equipment, and permits the training of unskilled labor to the point of full productivity in the least time. There are a few departures from this general practice in the case of certain products that require considerable special machinery. In these cases the few general type machines required are grouped with the special machinery into the department for the complete manufacture of the article.

The grouping of operations into department by class of work is dictated by the great variety of the company's products, including over 13,000 separate and distinct forms of apparatus, in the construction of which there are over 110,000 different kinds of parts, made from 18,000 different kinds, sizes and shapes of raw material. A considerable portion of these products are made in comparatively small quantities.

One difficulty encountered in handling so large a variety of products with departmental groupings of classes of machines is that of maintaining a proper balance of equipment in all the departments. Statistics specially maintained for the purpose enable the company to ascertain at any time just what classes of equipment are out of balance and whether or not there are sufficient facilities for handling anticipated business. If the space required exceeds the company's present floor space capacity, arrangements are immediately made for the necessary additional buildings in accordance with the ultimate layout of the plant. The need for additional machines, or adjustments in the existing equipment as brought out by the capacity study of the anticipated program are then provided for.



## OPENS NEW HOME

### Chamber of Commerce of United States Listens to Address by President Coolidge and Its President

WASHINGTON, Oct. 28.—At the semi-annual meeting here last week, the Eastern Division of the Chamber of Commerce of the United States adopted resolutions bearing upon the questions of importance to industry. One resolution declared "in favor of private ownership and operation under Government supervision" of public utilities, while another strongly urged reduction in expenses of the Government and in taxes. Another resolution condemned waste and urged standardization and the elimination of unnecessary varieties in products.

The meeting was characterized by the opening of the new home of the chamber on which occasion it was addressed by President Coolidge. President Richard F. Grant, of the Chamber of Commerce, condemned loose thinking, especially on economic questions, which he declared was one of the evil fruits of the war. He said that if clarity is to be promoted in thinking about business, it is necessary to establish the fact that better business "fulfills its function of providing for the material needs of mankind or it does not."

He added:

"Reliance of the country upon business enterprise has worked in the past. It has been the greatest single force that has advanced us to our present position.

If left free to produce the results which initiative, vision, resourcefulness, courage and perseverance bring, it will give to future generations the opportunity to look back upon us and the world in which we live very much as we look back upon the meager world of our forefathers.

"I concede that we should always strive to bring high moral and spiritual standards into business conduct, but I do not concede that business is a sordid affair because of the fact that it provides for the very material wants of mankind.

"There is one thing sure about our present business system; it works and it does provide for the material needs of mankind. Clearly it is a great public service to promote clear thinking about it. It is good judgment to understand the real facts first and do the thinking about them afterwards. Now our present business system has a record of accomplishment in providing for and enlarging the material needs of mankind which reads like a romance, and for the future it holds vast promise.

"This type of clear thinking will stop a lot of loose ideas which are pleasing to the demagogues and which experience the wide world over cries out against as falsehoods. Therefore, let us first make the case for business as now constituted, this machine which combines the best out of the experience of the ages, this machine which does provide for the material needs of mankind. And then with the facts let us examine the works, composed of capital, management, employees and the public, without any one of which the machine will not function."

## BUSY AT SEATTLE

### General Conditions Good but Buying Previous to Election Is Light

SEATTLE, Oct. 24.—With Presidential election day less than two weeks away, there has been a further slowing down in buying in the Seattle steel trade, and any new orders being placed represent only actual needs of jobbers and consumers. The same opinion prevails here as in the East as to the result of the election, but no chances are being taken by the trade that this opinion might be wrong. Stocks of steel products in local warehouses and in hands of consumers at present are the lowest ever known, and with the election out of the way and the expected result secured, there is looked for a very active buying movement in practically all lines of steel, but not to be accompanied by any higher prices, at least not for a considerable time. It is realized here that present prices of steel allow only a fair profit to the large interests that have the most modern mills and locations for delivery, but at the same time it is just as well known that capacity is so large that it can take care of any abnormal demand for months to come before the mills would be in the shape with orders that they could afford to turn down business based on prices that were not satisfactory to the sellers.

#### General Business Good

General business conditions in Seattle, aside from steel, are good, especially the building trade, which is the most active ever known in the history of the city. Up to Oct. 1, building permits were issued here to the amount of over \$25,000,000, and the amount is expected to reach \$30,000,000, before the close of the year. This naturally has created a heavy demand for all kinds of building materials with the single exception of structural steel, as most of the large buildings here are of reinforced concrete construction, very little steel being used, except for reinforcing. Labor has been well employed over the entire year so far, and at high wages, this making for good business among the stores.

While there is more inquiry for steel, actual sales are small and only for actual needs, as noted above. The trade is buying cautiously, believing that should there be a sudden increase in demand, the mills with

their enormous capacity can quickly meet it, and there will be little delay in securing supplies.

The city of Seattle is concreting many of its streets in the residence districts, and while doing this work is lifting many of the old wooden water lines, replacing them with steel or cast iron lines. The city came in the market recently for about 1300 tons of pipe for water lines, made up of 4-in., 8-in. and 30-in. sizes, and when bids were asked for, some very low prices were made on riveted steel pipe, but it was finally decided by the city engineers to use cast iron, and the order was placed with the local office of the United States Cast Iron Pipe & Foundry Co.

The demand for plates has been quiet for some months, only an occasional small order coming out, on which low prices have usually been made. Ordinary steel plates of tank quality have sold delivered here as low as 2.25c., this figuring back to about 1.52c. at Pittsburgh mill, and to almost that low a price to mills farther east that have some slight advantage over Pittsburgh in freights.

#### Steel for Viaducts

Demand for structural steel has also been quiet for a long time, owing largely to the fact that concrete construction is so much used here. Recently, the Alaska Engineering Commission, through Major C. E. Dole, purchasing agent, put out inquiries for close to 3000 tons of structural steel for viaducts to be built on the line of the Government railway in Alaska. Several local representatives of Eastern mills have sent this inquiry to the home office, but it will likely be some time before anything definite develops. Pittsburgh mills are not apt to participate, as the freights are against them as compared with mills close to the Atlantic Coast. Structural shapes are quoted as low as 2.35c., delivered here, equal to about 1.63c., Pittsburgh mill.

Sheets are quiet in demand, most of the local business going to makers in the San Francisco district on such sizes and gages as they make. Eastern mills are adhering to 3.50c. for black and 4.60c., Pittsburgh, for galvanized, when they do quote.

Steel ingots produced in the Sarre in March, April and May were 138,412 tons, 128,005 tons and 123,695 tons.

### Testing Society's Committees Meet in Washington

WASHINGTON, Oct. 28.—With an attendance of 115 members, committees of the American Society for Testing Materials met in Washington and held a three-day session, from Wednesday through Friday, last week, at the Wardmann Park Hotel and the Bureau of Standards. An exhaustive program of technical discussion was dealt with by various groups preparatory to reports to be formally presented to the society for action. The meetings during the day were held at the Bureau, while those in the evening were held at the hotel, where there also were informal dinners. Trips were made through laboratories of the Bureau and the entertaining program included films made by Colonel Birdseye's expedition through the Grand Canyon of the Colorado.

Among subjects on which reports were made by committees were the standardization of corrosion tests, methods of sampling and testing ferroalloys, and specifications and tests for steel tubes, pipes, plates, forgings, etc., and of various metal alloys, including those of aluminum.

Much interest was shown by a committee which inspected specimens of sheet iron and steel, exposed for a weathering test at Annapolis seven years ago. These sheets are one of three sets exposed for test. One set was placed at Annapolis where the materials are exposed to sea air, another at Fort Sheridan, Ind., where there is a typical inland atmosphere, and one at Pittsburgh. The test at Pittsburgh is over, all the specimens having failed, it was reported, while the sheets at Annapolis and at Fort Sheridan are now beginning to fail. In each case it was found that copper bearing sheets stood up better than those free from copper. Plans for a similar series of tests of wire screen were reported to another committee of the society. These tests, which are being undertaken with the aid of the Bureau of Standards, involve the exposure of screens in four locations: an inland location, an industrial center, a sea-coast and a tropical seacoast. A similar investigation is being planned to cover galvanized and other coated metals.

### Annual Convention of the American Institute of Steel Construction

The annual convention of the American Institute of Steel Construction will be held at the French Lick Springs Hotel, French Lick, Ind., for three days, beginning Thursday, Nov. 13. An extensive and varied program has been prepared and includes addresses by experts on fireproofing structural steel, benefits of a uniform method of cost accounting and the relation of the structural steel industry to the business of the country. Charles F. Abbott is executive director of the institute, which has headquarters at 350 Madison Avenue, New York.

### Concrete Reinforcing Steel Institute Organized

An organization to be known as the Reinforcing Concrete Steel Institute was formed last week by the reinforcing bar dealers of the country in conference at the William Penn Hotel in Pittsburgh. Headquarters have not been decided upon, but eventually the institute will have a permanent secretary and will undertake the standardization of materials, of specifications and building codes and of engineering practice, and also the "collection, compilation and dissemination of statistics and other information to members, to the public, and to State and Federal officials, relative to reinforced concrete construction." The institute further proposes to study costs and the standardization of methods of fabrication, of contracts and of forms of proposal.

Officers were elected as follows: William Pouch, Concrete Steel Co., New York, president; George Routh, Kalman Steel Co., Chicago, vice-president, and C. L. Meyer, Concrete Engineering Co., Omaha, Neb.,

treasurer. The directors in addition to the officers are: For one year, James Cowin, the Cowin Co., St. Paul, Minn.; E. L. Ryerson, Jr., Joseph T. Ryerson & Sons, Inc., Chicago; for two years, Peter J. Icoe, Icoe Brothers, New York; W. B. Davis, Knoxville Iron Works, Knoxville, Tenn.; for three years, Julius Kahn, Truscon Steel Co., Youngstown, Ohio, and A. E. Landau of the American System Co., Chicago.

Since this meeting was merely for organization purposes, plans are tentative and the efforts of the institute will be placed upon a working basis only after the selection of a permanent secretary.

### Traffic Officials of Steel Companies Will Hold Meeting

Substantiation of the assertion in THE IRON AGE of Oct. 2 last, that the abolition of Pittsburgh as a sole steel price basing point would be followed by a movement seeking more equitable freight rates from Pittsburgh district points, as compared with those from other producing centers, is found in a call recently issued by A. R. Kennedy, traffic manager Pittsburgh Steel Co., for a meeting of traffic officials of steel companies in the Pittsburgh and nearby districts to be held in Room 1001, Chamber of Commerce Building, Pittsburgh, beginning at 10 a. m. Thursday, Oct. 30.

This meeting is preliminary in character, since it will be devoted to a discussion of the effects upon the various companies of the new mode of quoting. It is not believed the meeting will formulate a formal demand for a rate revision, but will confine itself to a full discussion of the situation from all angles and the appointment of a committee to take up the suggestions that are brought out and to draw up recommendations to be submitted to another meeting. It is stated that this meeting is entirely distinct from any other freight rate revisions that have been agitated in the past or now are pending before the Interstate Commerce Commission.

### Terne Plate Simplification

The Terne Plate Simplification Committee at the Atlantic City meeting of the Metal Branch of the National Hardware Association Oct. 14 recommended elimination of 12-lb. and 35-lb. coatings, representing a reduction of approximately 22 per cent in the number of kinds of terne plate. The recommendation approved by the meeting, final action awaits the result of a meeting to be called by the Department of Commerce, to which manufacturers, distributors and users will be invited. The committee consists of F. H. McNeive, of W. F. Potts, Son & Co., Philadelphia; L. D. Brueckel, Weirton Steel Co., Weirton, W. Va., and H. N. Taylor, of N. & G. Taylor Co., Philadelphia, chairman.

### Depression in French Iron and Steel Industry

The French iron and steel industry continues in a depressed condition, cable advices from Assistant Commercial Attache J. F. Butler, Paris, state. There is no foreign competition in the domestic market, but exports are low. Pig iron production has been maintained notwithstanding the weak, sagging market. Orders are being taken for phosphorus pig iron at 285 francs per metric ton, f.o.b. furnace. Hematite pig iron is bringing about 400 francs per ton.

Semi-finished steel is better off than pig iron, due to increased exports. The domestic prices on blooms are around 400 francs and on billets about 480 francs. Finished steel products are dull, export business being eagerly sought. However, the demand for plates is active.

Liner, plain and slip bushings for drill jigs have been added to the line of the Ex-Cell-O Tool & Mfg. Co., Detroit. Bushings for drills from No. 55 to 2 in. in diameter will be carried in stock.



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ESTABLISHED 1855

# THE IRON AGE

A. I. FINDLEY

EDITORS:  
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GEORGE SMART

Member of the Audit Bureau of Circulations and of  
Associated Business Papers, Inc.

Published every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

F. J. Frank, *President*

PRINTED IN U. S. A.

George H. Griffiths, *Secretary*

Owned by the United Publishers Corporation, 239 West 39th Street, New York. Charles G. Phillips, *Pres.* A. C. Pearson, *Vice-Pres.* F. J. Frank, *Treas.* H. J. Redfield, *Secy.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: 425 Park Square Building. Philadelphia: 1102 Widener Building. Cleveland: Guardian

Building. Detroit: 7338 Woodward Ave. Cincinnati: First National Bank Bldg. Buffalo: 833 Ellicott Square. Washington: 536 Investment Building. San Francisco: 320 Market St. London, Eng.: 11 Haymarket S.W.1. Subscription Price: United States and Possessions, Mexico, Cuba, \$6.00; Canada, \$8.50; Foreign, \$12.00 per year. Single copy 25 cents.

Entered as second-class matter, June 18, 1879, at the Post Office at New York, New York, under the Act of March 3, 1879.

## New Influences in Steel Prices

IT is impossible to eliminate the human element from the transaction of business. Markets are made directly by men, not by statistics. The statistics may be consulted first, but man has the final say. It is not to be supposed that the agitation against Pittsburgh plus really contemplated the removal of human nature as a factor in the steel market.

Steel manufacturers will aim in the future as in the past to make profits. It is doubtful if the advocates of district steel markets, who claimed that "savings" would result to consumers in certain localities, really thought that year by year in future these alleged savings would simply be deducted from profits the steel industry otherwise would have made. We need not theorize on the compensating influence of human nature when we have a practical illustration in the course of steel prices in the past few years. According to the precedent of pre-war times the relation between steel productive capacity and steel consumption in the past two years would have indicated lower prices than have prevailed. But the human element has been a factor. The individual seller was fully aware of the relation, and was correspondingly reserved about cutting prices.

The new district steel markets were established so recently that what has occurred to date may not be of great significance, yet it is worth while to note that during this period there have been practically no declines in steel prices except those reductions in delivered prices in certain areas that were brought about simply by the change from Pittsburgh plus. For months previous there had been almost continuous, though not sharp, declines. It will be interesting to see whether the one kind of decline has not taken the place of the other.

Without asserting that it was the definite purpose of the agitation against Pittsburgh plus to increase competition between steel producers, the point may be discussed. It is quite true that when the price of a given rolled steel product was on one single basis the seller had an easy mark to toe. It is also true that when some one cut

the price widespread consequences were probable. Now, when interest is localized, cutting may have less widespread consequences. It is conceivable that it will be harder to pull the market down. Already there has been much complaint among steel buyers that they do not know what their competitors are paying. In the old days when one knew that another was getting a lower price he proceeded to get it also.

If, however, competition should produce lower prices than would have ruled had Pittsburgh plus not been abolished, the natural result would be the elimination of some producers. The outcome would be the reduction of productive capacity rather than the building of additional capacity, as was so often predicted. The eventual sequel to such a shaking out, in any line of business, is higher prices when demand grows.

No general and continued favorable result to any class of people can be expected from the change that has occurred. What is seen, and what will be seen for a long time to come, is a great deal of confusion and uncertainty, taking men's energy from better things. The steel industry, defining the industry from the broad standpoint of producer, distributor and manufacturing consumer, was well organized for the conduct of its work, putting articles of steel into the possession of the ultimate user. That organization has been disturbed and cannot function so well. There is no step toward efficiency. Whoever does get anything out of it merely gets it from some one else.

## The Electric Furnace and Gray Iron

QUIETLY but steadily the application of electric furnaces to gray iron has been increasing in recent years. A round table discussion conducted by American electrochemists at Detroit, Oct. 2 (THE IRON AGE, Oct. 9), brought out many new facts, as did also a session at the foundrymen's convention at Milwaukee, Oct. 15 (THE IRON AGE, Oct. 23). Particular emphasis was given to the advantages of electric furnaces in respect to super-heating, deoxidation and desulphurization. Electric deoxidation largely disposes of one of the



most important problems now confronting many gray iron foundrymen—the presence of oxidized iron due to a quite general use of scrap in blast furnace practice.

Between the Atlantic and the Pacific there are now in operation in American foundries fully 15 electric furnaces of various types producing gray iron castings. The problem of the disposition of large quantities of iron borings has been largely solved. Melting them with other forms of scrap, a very satisfactory product is secured. In some localities successful competition with old processes is maintained. And in alloy iron castings valuable results are appearing.

Ten years ago there was no application of electricity to gray iron. During the war some feats were accomplished, in particular the production of synthetic castings and synthetic pig iron. In the past few years the progress made, while now largely in specialty foundries, is significant and prophetic. Electric melting, or duplexing with the cupola, combined with heat treatment, also in its infancy, promises to give gray iron a place of new importance.

### Progress in Preparedness

THE celebration of National Defense Day was not entirely satisfactory in producing evidence of real progress toward preparing the country to meet a great war emergency. There were many parades and much speech making and some statements as to what was being done in cooperation with manufacturers, but little that was concrete and definite. Slowly, however, evidence is being produced of the important steps being taken to prevent the recurrence of the unpreparedness which existed before the world war.

An important contribution to the subject is an article in the October *Atlantic Monthly* by Samuel Taylor Moore, on "The New Preparedness," in which the author sets forth in some detail what has been done and what it is hoped will be done by the Army and Navy and other branches of the Government. Mr. Moore explains that the foundation of the plan consists of approximately 10,000 allocations to manufacturers for the production of essential supplies and that over 6000 plants have been allocated so far. Both manufacturing and raw material sources have been surveyed in a comprehensive way and Mr. Moore states that industrial mobilization will be administered, as far as the War Department is concerned, by 60 to 100 officers who will be commissioned from the leaders of America's industry. He does not overlook the fact that many industrial leaders who are cooperating in the industrial mobilization are not optimistic, because they doubt that such a broad plan can be administered by men trained in army methods and out of touch with civilians.

Mr. Moore gives assurance that the Army does not contemplate chasing industrials out of their plants, but seeks to substitute coordination for competition in the production of supplies. The plan calls for the synchronizing of the three essentials of victory: man power, munitions, time.

There is, however, one weak spot, and Mr. Moore does not hesitate to point it out. He says:

Slowly, indeed, but with sureness, the Army industrial staff, supplemented by Government experts in many departments, is solving the problem of industrial preparedness. In six of the seven departments, approximate perfection is but a matter of time; a critical condition exists only with relation to the air service. Unlike necessities of the ordnance and other military supply departments, an airplane, as yet, cannot be built in different factories and later assembled from interchangeable parts. Too much specialized workmanship is required.

Pointing out that with a single weak link the chain of preparedness is worthless the author says that the world war experience has demonstrated the importance which the airplane would assume should war be declared. This is the testimony of all who have given study to the subject. Arthur Brisbane, in his address before the American Iron and Steel Institute Friday night, contended that the one problem before the country today is how to improve its air service so as to compete with other nations in war when necessary. This may seem to be a strong statement, seeing that so many other problems need solution; but it would be difficult to exaggerate the importance of adequate appropriations by Congress to extend the air service rapidly and at the same time with utmost efficiency.

### The Use of Capital

THE term national economy defines the system whereby all of the families that in the aggregate comprise a nation conduct their affairs, producing the goods that they need and consuming them according to their wish. The evidence of their collective wishes and the determination of them, are to be found in the markets. Prices are the expression of what is wanted and are the promoters or discouragers of production.

If the people want automobiles and amusements they will have them if they can. If they can have them only by the sacrifice of other things that are not wanted so much they will dispense with these other things. This will be reflected by relatively high prices in some industries and low prices in others. It is only in this way that our national economy can operate unless we adopt the theory of socialism and consent to have a superior will fix what we shall and what we shall not have, just as the head of a family governs his unit.

The national economy is therefore a continuous process of production, distribution and consumption which operates by the coordination of many factors. Some of these factors are not plainly in evidence and are apt to be misunderstood, owing to their obscurity, or even ignored, owing to their invisibility. We are in constant want of houses, for example. Whether we shall have a new and needed house or shall get along with an old, unsatisfactory one depends upon the cost of building. Everybody can see and understand that the immediate cost of building is determined by the labor and materials that are used. But everybody does not see so clearly, perhaps not at all, the cost that represents the use of capital, viz., the railroads that carry the material, the plants that

fabricate it, the tools that are used by the builders themselves.

In our national economy we are, all the time, not merely consuming the foodstuffs, clothing, fuels, etc., that we need, but also are we consuming the means for making and transporting them. The difference between these consumptions is that one is immediate while the other is spread over a series of years. A national economy that operates without clear recognition of this will inevitably encounter trouble sooner or later. This should be considered by the representatives of the people in levying taxes and in producing a variety of artificial conditions that disturb the natural economic balance.

Capital is not synonymous with wealth; nor is it with money. Gold is both wealth and money, but it is not capital. Federal Reserve notes are money, but they are not capital, being merely promises to pay; in this case very well fortified promises. Capital is the definition of those goods by the use of which more goods can be produced. Mines, factories and railroads are capital; so are the tools of the artisan.

Capital, or capital goods, with use is subject to wear. For every pair of shoes or every gallon of gasoline that is produced some portion of plant is worn out or deteriorated, and at some time will have to be replaced. The reservation of business earnings is largely for this purpose, not for escaping the tax gatherer. The corporation that pays out all of its apparent earnings as dividends eventually learns that it has been paying out its capital and is left with nothing but useless, valueless bricks and mortar and metal junk.

So it would be in the national economy if all of our capital goods were treated in such a way. Eventually we should lack the means for production and should be unable to get what is required for immediate consumption. This is what has happened in the economies of Russia and Germany and other Continental countries, not in their cases owing to extravagance but rather to failure to make replacements, owing to the demands of warfare.

In order to produce, a country must have an adequate supply of capital goods and anything impairing them is bound to work disadvantageously. It does not matter to whom these capital goods belong, providing that they exist and be used intelligently. It would be beneficent if all of the people owned all the capital goods and used them intelligently and kept them up. But if they were distributed among many persons who would neglect to keep them up there would be trouble ahead. Similarly would there be trouble if unwise legislation and artificial restrictions imposed by popular clamor should prevent them from being kept up and extended.

Some critics of the existing capitalistic system have alleged that it has been made to work so as to produce too much saving, i.e., too much capital goods, thereby depriving the masses of immediate enjoyment to which they are entitled. Sound thinking inevitably must lead to the conclusion, however, that by no possibility can there ever be too much saving, by no possibility so long as the national economy is viewed as a continuous proc-

ess, which obviously it is. No matter who owns the capital goods, no matter who manages them or how, if anything be done to impair them or to check their growth the supply of consumers' goods must suffer *ipso facto*.

### Heavy Railroad Traffic

**B**OTH last year and this year the railroads have handled very heavy freight traffic. It is well to recall how much trouble traffic congestion caused during the war and in 1920; thereby business will realize how well it is being served nowadays. It had come to be that when active business was expected, railroad congestion would be predicted, and thus the offering of much freight would not result necessarily in high records being made in actual movement.

In the week ended Oct. 11 car loadings amounted to 1,088,462. The common observation has been that this made a new record for the present year "but" fell short of the previous record, made in September of last year, by some 9000 cars. That is a true statement, as a matter of statistics, but it does not indicate properly the general movement, for the record week was one that stood well above its fellows.

A longer range and therefore more informative and conclusive comparison is that in the six weeks ended Oct. 11, or from Aug. 31, the loadings this year were 6,311,871 cars, against 6,313,497 cars in the same period of last year. The decrease is only 1626 cars, or one-fortieth of 1 per cent.

In other words, we have been running of late quite as well as we ran last year, when we outdid all records. Earlier this year the loadings did not altogether equal those of a year previous. The cumulative loadings, Jan. 1 through Oct. 11, have been as follows:

1922.....	33,230,537
1923.....	39,468,953
1924.....	37,868,482

Thus, while we are now at the pace of last year, the year's record to date is only 4 per cent below that of last year and it is 14 per cent above that of 1922.

While the railroads may have trouble in bad weather, they appear to be very well fitted for rendering full service in ordinary weather. The Bureau of Railway Economics has just issued a presentation which gives the rolling stock statistics for each of the past eight years. This is for Class I railroads, carriers with annual operating revenues above \$1,000,000, representing 90 per cent of the mileage and 96 per cent of the total revenue. Changes in the number of freight train cars were as follows:

	Installed	Retired	Net Change
1916.....	126,851	106,272	+20,579
1917.....	117,210	62,253	+54,957
1918.....	65,249	56,024	+9,225
1919.....	76,019	43,274	+32,745
1920.....	36,044	75,197	-39,153
1921.....	63,406	69,245	-5,839
1922.....	105,394	126,471	-21,077
1923.....	223,724	211,617	+12,107

This brought the total number of cars in service at the end of 1923 to 2,347,588. In the three years 1920-1-2 the railroads went backward in the number of cars in service, but they really went forward from the practical standpoint, for they retired cars because they were able to do so. The



carrying capacity increased, because the cars retired were smaller than those installed. From the end of 1919 to the end of 1923 the number of cars decreased 2 per cent, but the average capacity increased from 41.9 tons to 43.7 tons, or by 4 per cent. The total carrying capacity increased in the four years from 99,001,041 tons to 101,382,013 tons, or by  $2\frac{1}{2}$  per cent, and no doubt the serviceability, per unit of rated carrying capacity, increased also.

## CORRESPONDENCE

### Wire Drawing and Properties of Steel

*To the Editor:* I have read with interest the articles by Mr. Comstock on "Wire Drawing and Properties of Steel" in THE IRON AGE, Sept. 11 and 18. Considerable work in this connection was carried out by Longmuir, who in 1912 reported to the Iron and Steel Institute (*Journal of the Iron and Steel Institute*, Vol. 86, p. 188), the results of numerous tests in this connection.

The writer, who has been much interested in the phenomenon of the critical range of deformation, shortly after Alkin's re-discovery of this phenomenon, wrote a series of articles on the effect of cold work on the metals and alloys, which were published in *Metal Industry*. In an article which appeared Dec. 12, 1919, he gave a number of curves showing the relation between strength and percentage reduction in diameter for quite a number of different steels. In particular the results of Longmuir's work were graphically reproduced and curves showing quite clearly a critical range of deformation were obtained.

It is of interest to note that the critical range of deformation was first discovered by Spilsbury and Howe, reference to whose work is made by the latter in his "Metallurgy of Steel" (1892, p. 216).

O. W. ELLIS,

Assistant Professor of Metallurgical Engineering.  
University of Toronto.  
Toronto, Canada, Oct. 2.

### Intermediate Products in Malleableizing

*To the Editor:* A reading of your report in THE IRON AGE, Oct. 23, of the malleable session of the A. F. A. at Milwaukee indicates that on one essential matter I did not make myself clear. Your abstract on page 1055 quotes me as believing that "What is really needed is a malleable product having satisfactory shock resistance properties for competition in the field of small steel castings."

What I did say, was that Dr. Hayes' "intermediate" products had so low a shock resistance that, although they are comparable with steel castings, they could not in this respect compete with normal malleable, whose shock resistance, as shown by Dr. Hayes, is about one and a half times, or twice that of soft steel castings.

H. A. SCHWARTZ,

Manager of research, National Malleable &  
Steel Castings Co.  
Cleveland, Oct. 23.

[The word "intermediate," qualifying "malleable product," was originally intended but unfortunately was omitted.—EDITOR.]

At the annual meeting of the stockholders of the Pittsburgh Steel Co., Oct. 28, the retiring directors were reelected and the board organized by the reelection of the present officers. They are: D. P. Bennett, president; Emil Winter, vice-president; Edward H. Bindley, vice-president; C. E. Beeson, vice-president; H. J. Miller, secretary, and Clayton Snyder, treasurer.

## JAPANESE TARIFF TO BE HIGH

### New Rates on Sheets and Tin Plate Effective in March May Spur Business Temporarily— Government Railroads Inquire

NEW YORK, Oct. 28.—No large export inquiries have appeared in the past week, and orders have been principally for small tonnages, with one exception. The Tokio Gas Co., Tokio, Japan, awarded the 1,250,000 ft. of black gas pipe, recently inquired for, to Mitsui & Co., and it is reported that the order will be executed by the leading interest. Practically no business is coming from China and Japanese traders with Chinese markets are also seriously feeling the effect of the civil war in China. This curtailment of Japanese export business is pointed out as partly responsible for the inability of Japanese merchants to buy abroad, another factor being the continued weakness in exchange.

Were it not for such obstacles as these, it is believed by Japanese exporters that there would now be a fairly active buying movement in tin plate and sheets, although prices of American mills on both these products are holding firm and somewhat in excess of Japanese price ideas, based on their current domestic market. Despite these obstacles, however, a genuine buying movement in sheets and tin plate seems to be expected before the end of the year. Tonnages purchased for delivery prior to March 10 will prove profitable to the Japanese merchant, as on that date the Conventional tariff with Great Britain expires and other nations, including the United States, previously operating under "most-favored-nation" treaties, will become amenable to the general tariff schedule. The Conventional tariff included tin plate, which paid a duty of 0.70 yen per 100 kin compared with 15 per cent ad valorem on the general tariff; plates and sheets, other than corrugated and not exceeding 0.7 mm. in thickness, taking a duty of 0.30 yen per 100 kin against 15 per cent ad valorem on the general tariff and pig iron, taking a duty of 0.083 yen per 100 kin against 0.10 yen per 100 kin on the general tariff.

It seems probable that this change in the tariff schedule will have a determining effect on trade with Japan in these products, although all producing countries will be affected alike. Light gage black sheets, for example, at the present quotation by American mills of about \$95 per ton, c.i.f. Japan, would pay under the 15 per cent ad valorem duty of the Japanese general tariff, exacted on the c.i.f. quotation, \$14.25 per ton. Under the present tariff of 0.30 yen per 100 kin and with the yen depreciated to 38.75c. in value, the tariff is about \$2 per ton. On tin plate, figured at about \$5.90 per 100 lb. box, c.i.f. Japanese port, including the usual extras, the current duty under the general tariff would be about 88.5c. per box, but under the Conventional tariff the actual duty at present is about 20c. per box.

Recent inquiries from Japan have been small with the exception of the Imperial Government Railway's inquiry, bids on which open Nov. 4, for about 11,000 tons of 60-lb., 70-lb. and 100-lb. rails. The Kobe Municipal Tramways Bureau has awarded the  $6\frac{1}{2}$  miles of 91-lb. high T-rails and the fish plates included in its recent inquiry to Suzuki & Co., but the bolts, nuts and spikes are understood to have gone to a British bidder, and the switches and curves have not yet been placed. One of the large Japanese export houses in New York recently booked an order for about 55,000 lb. of strip steel from a bicycle maker in Japan. A sizable inquiry has appeared in this market from a Chinese railroad. The Kiaochow-Tsinan Railroad, a short line operating between Kiaochow and Tsing-Foo, has issued an inquiry for 36 bridge spans of 15 to 46 meters each, bids on which will be opened Dec. 5. While this inquiry has been received by Japanese exporters, it is believed that the purchase will be made direct from Shanghai.

Thirty-two American cities showed an average increase of 0.9 per cent in the cost of living, between June and September.

### Test of Worthington Diesel-Type Oil Engine

The Worthington double-acting, two-cycle, Diesel-type oil engine, described in THE IRON AGE of Sept. 4, has completed a 30-day full-power non-stop test run on the block at the Worthington plant in Buffalo. The run finished at 10:05 p. m. Saturday, Oct. 25. On Sunday morning in the presence of a number of engineers the engine was started up again, stopped and run in reverse. It was then taken down for inspection and found in perfect condition. Micrometer measurements of the inside of the cylinder, the piston and the rod showed no wear in most cases and in no case greater than 1/1000 in. A slight soft carbon deposit was found in some of the scavenging ports but not enough to interfere with the engine operation. General Inspector Olson of the United States Shipping Board technical staff, who supervised the test, declared that the engine could have gone on running almost indefinitely. It was the opinion of those present that the test had demonstrated well the possibilities of the new type of engine, which is considered a striking advance over previous Diesel engine designs.

Among the engineers present besides officials of the Worthington Co. were Capt. R. D. Gatewood, U. S. N., head of the construction and repair department of the United States Shipping Board; Commander Holbrook Gibson, U. S. N., representing the Navy Department; William F. Gibbs, consulting naval architect, New York; Vice-President Palen and Chief Engineer Bailey of the Newport News Shipbuilding & Dry Dock Co.; Messrs. Wright and Rhys of the Standard Oil Co. of New York, Dr. Jones of the Standard Oil Co. of New Jersey, Marine Superintendent Drake and Mr. Jackson of the Texas Co.

### Contracts for Mystic Iron Works Furnace

The Mystic Iron Works, Boston, has placed additional contracts for equipment required for its blast furnace to be erected at Everett, Mass. These contracts include two turbo blowers, each of 40,000 cu. ft. air per minute capacity; two motor generator sets; and two turbine generator sets to be furnished by the General Electric Co. The Erie City Iron Works, Erie, Pa., has the contract for a battery of six boilers of 800 hp. each, while the Mead-Morrison Mfg. Co., East Boston, has the contract for the bridge, which has a 250-ft. central span. The Lumen Bearing Co., Buffalo, will provide the cooling copper for the furnace.

To date the company has completed approximately 240,000 sq. ft. of dredging, or about 40 per cent of the estimated total necessary for river channel and for land filling purposes. Foundations for the furnace and other plant units are going in. Construction of the plant therefore is on scheduled time.

### Eastern Mills Still Have Advantage on Pacific Coast Business

SEATTLE, Oct. 25.—Investigation here discloses clearly that the Pittsburgh plus decision will not affect the local steel trade in any way. Seattle, and, in fact, all Pacific Coast points, have always been an open market, delivered prices here being based on the mill price wherever located, plus the straight rail, rail and water or all water haul. However, there is one thing certain, and that is, the Eastern mills that have only a short rail haul to the water, or no rail haul at all, the Bethlehem Steel Corporation for example, will continue to have a material advantage over Pittsburgh and Chicago mills in the matter of freights to Pacific Coast points. Chicago mills must pay an all rail freight to get to the Coast, Pittsburgh pays a rail and water freight, while Atlantic seaboard mills have a low rail freight to the water, and then the low water rate to Coast points. Mills in the Philadelphia district can get to the water for 6c. to 8c., and then have the benefit of the 40c. water rate to the Coast, while the Bethlehem Steel Corporation can make all water shipments from Sparrows Point at the 40c. rate on plates, sheets, tin plate and other products and have an advantage of about \$6 per ton on Pittsburgh mills. Not one of the plants of the Steel Corporation is so situated that it has an all water

haul to the Coast. Hence, the Eastern mills, and especially Bethlehem, seem to have the advantage of their inland competitors in competing for Coast business.

The Bethlehem Steel Corporation has succeeded in building up a rather large trade in sheets and tin plate in the Coast cities since it went into those lines, much of which formerly went to Pittsburgh and other inland mills. It is believed that after the confusion resulting from abolishing Pittsburgh plus has been cleared up, a determined effort will be made by Eastern mills which must use the railroads in part at least to get their products to the Coast, to get a material reduction in freights, but this may prove hard to obtain.

### Fire-Brick Shipments

Shipments of clay fire-brick, the telltale of actual business, showed a fair-sized gain last month over those of the month before, according to the monthly statistical report of the Refractories Manufacturers' Association. September shipments were 33,319,674 9-in. equivalents, or 64 per cent of economical monthly producing capacity, as against 31,723,597, or 61 per cent in August. For the second consecutive month shipments exceeded production, last month by about 1,500,000 9-in. equivalents, as against 215,000, the difference in August. There was a reduction in stocks on hand at the end of September of about 2,300,000 as compared with those at the end of August.

Silica brick shipments in September showed a decrease from those of August of about 670,000, the figures being 3,608,719 for September and 4,278,450 for August. September shipments were 45 per cent of economical monthly producing capacity and those for August 53 per cent. Shipments exceeded production by 10 per cent in September and this produced a like cut in the stocks on hand as of Sept. 30.

"Free" stocks of clay fire brick as of Sept. 30, were 68,504,557, equal at the September rate of shipments to over two months' requirements. Such stocks of silica brick at the end of September were 3,937,977, or only slightly more than a month's supply at the September shipping rate.

### Proposed Freight Rate Increase to Be Postponed

PITTSBURGH, Oct. 27.—An increase of 15.8 per cent in short haul freight rates on iron and steel products, approved by the Pennsylvania Public Utilities Commission, to have become effective Nov. 1, will probably be suspended, as a protest has been entered against the increase by the steel companies which are affected. The increase would affect all tariffs of 15½c per 100 lb. or less and would mean, for example, that the rate from Pittsburgh to Youngstown, now 9½c per 100 lb., would go to 11c. Opposition to the increase is based on the fact that if it were to become effective, it would serve as a precedent and a basis for future adjustments, and since a general revision of freight rates is in the making, the short haul tariffs of the future would be based upon the proposed rates rather than the present ones.

### Kansas City Steel & Wire Co. Buys McKenna Steel Working Co.

The Kansas City Steel & Wire Co., recently incorporated with \$750,000 capital stock, has purchased the plant of the McKenna Steel Working Co., Twelfth Street and Terminal Railroad tracks, Armourdale District, Kansas City, Kan., and will remodel it for the manufacturing of steel bars, wire rods and wire products. The McKenna mills, which were originally installed for rerolling rails are adaptable through the rail slitting process for the production of rail steel bars. New equipment to be installed includes 8-in. and 10-in. mills, cooling beds, two 50-ton open-hearth furnaces, a hydraulic press, and wire and nail machinery. Approximately \$500,000 will be spent for the improvements. L. W. Conroy, general manager and operating vice-president, was formerly identified with the Lackawanna Steel Co. at Buffalo, and with the Carnegie Steel Co., Pittsburgh.



# European Business Still Marking Time

English Feeling Is Despondent—Expensive Fuel Held to Blame  
—Continent Depressed—Belgium and Austria  
Shut Down Furnaces

(By Cable)

LONDON, ENGLAND, Oct. 28.

IMPROVEMENT in pig iron demand is not maintained, but prices continue firm. Little alteration in general business is anticipated until the election is over. There is more inquiry for hematite, but few orders are being placed. Unsold stocks of North-eastern producers are about 150,000 tons.

Foreign ore is dull. Bilbao Rubio is held nominally at 21s. 3d. to 22s. (\$4.78 to \$4.95) c. i. f. Tees.

Finished steel is quiet. More shipbuilding contracts have been placed, but the general export demand still is poor. Quotations are unaltered, but concessions are probable for suitable specifications.

Contract now has been placed with Bolckow, Vaughan & Co., Ltd., Middlesbrough, by the Hull Corporation for 1500 tons of tram rails and 500 tons of sole plates. This order originally was awarded to German suppliers at £2500 (\$11,250) less, but that decision since has been reversed.

For financing its new plant, the Consett Iron Co., Ltd., has completed the sale of £1,000,000 of 6 per cent debenture capital shares. The capital expenditure during the past five years has been £3,500,000. The new plant will be ready for operation early next year.

## On the Continent of Europe

Continental position is obscure. Endeavors are being made in some quarters to advance prices, but cheap Belgian sellers still are prominent. Business is restricted. Important pig iron producers are off the market or asking high prices, but supplies still are obtainable at comparatively low figures.

In Austria the Alpine Montan Gesellschaft, has damped the only active furnace in the country. No Austrian pig iron now is being produced.

In Belgium the Société Anonyme des Usines de Moncheret has blown out its Hainaut furnace.

## Sheets and Tin Plate

Tin plate is quiet but the market is firm at the schedule.

Galvanized sheets are weak and in poor demand; 24-gage corrugated, in bundles, being sold at £17 10s. (3.52c. per lb.).

Black sheets are dull and there is little demand visible in the market.

## Great Britain Cannot Compete with Continent Because of Extortions of Miners' Unions

LONDON, ENGLAND, Oct. 15.—There are no bright spots on the horizon of the British iron and steel trade so far; in fact, from week to week further furnaces are being put out of action, but nevertheless stocks in makers' yards on the East Coast are accumulating. Demand has fallen to a negligible level and a distinctly gloomy view is taken of the future. At the moment of writing No. 3 Cleveland foundry iron is about 80s. (\$18) while steel prices have been reduced again this week in all directions by 10s. a ton.

Scotland appears to be in a particular state of stagnation, only 29 furnaces out of 102 available being at work, and even so more iron is produced than can be absorbed. It is understood that two further producers will cease operation entirely as soon as their stocks of ore are exhausted, and when this happens there will be only 18 furnaces in blast in Scotland, 10 on foundry, 7 on hematite and one on basic.

Little wonder under these conditions that the tone of the market is distinctly depressed, and he would be bold indeed who could foresee any marked change for the better, in view of the ever-growing importance

British and Continental prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at \$4.50 per £1, as follows:

Durham coke, del'd..	£1 5s.	\$5.62
Bilbao Rubio ore,...	1 4	5.40
Cleveland No. 1 fdy..	4 5	19.12
Cleveland No. 3 fdy..	4 0	18.00
Cleveland No. 3 fdy..	3 19	17.77
Cleveland No. 4 fdy..	3 18	17.55
Cleveland No. 4 forge	4 0	18.00
Cleveland basic.....	4 0	18.00
East Coast mixed.....	4 6½	to £4 7s.
East Coast hematite...	4 10	to 5 0
(a) Ferromanganese...	12 10	and 13 0*
Rails, 60 lb. and up...	9 10	to 9 15
Billets.....	7 10	to 8 5
Sheet and tin plate	8 12½	33.81
bars, Welsh.....	1 3½	5.29
Tin plates, base box..	1 3½	
C. per Lb.		
Ship plates.....	9 0	to 9 10
Boiler plates.....	12 0	to 12 10
Tees.....	9 2½	to 9 12½
Channels.....	8 7½	to 8 17½
Beams.....	8 2½	to 8 12½
Round bars, ¾ to 3 in.	9 7½	to 9 17½
Galv. sheets, 24 gage	17 10	to 17 15
Black sheets, 24 gage	12 10	2.51
Black sheets, Japanese		
specifications.....	15 8	2.06
Steel hoops.....	10 15	and 12 10*
Cold rolled steel strip,		
20 gage.....	16 0	3.21

\*Export price.  
†Ex-ship, Tees, nominal.  
(a) Nominal.

## Continental Prices, All F. O. B. Channel Ports (Nominal)

Foundry pig iron:			
Belgium.....	£3 10s.	\$15.75	
France.....	3 10	15.75	
Luxemburg.....	3 10	15.75	
Basic pig iron:			
Belgium.....	3 8½	to £3 9s.	15.41 to \$15.52
France.....	3 8½	to 3 9	15.41 to 15.52
Luxemburg.....	3 8½	to 3 9	15.41 to 15.52
Billets:			
Belgium.....	4 17½	to 5 0	21.94 to 22.50
France.....	4 17½	to 5 0	21.94 to 22.50
Merchant bars:			
Belgium.....	5 10	to 5 12½	1.10 to 1.13
Luxemburg.....	5 10	to 5 12½	1.10 to 1.13
France.....	5 10	to 5 12½	1.10 to 1.13
Joists (beams):			
Belgium.....	5 10	to 5 12½	1.10 to 1.13
Luxemburg.....	5 10	to 5 12½	1.10 to 1.13
France.....	5 10	to 5 12½	1.10 to 1.13
Angles:			
Belgium.....	8 9	to 8 5	1.61 to 1.66
½-in. plates:			
Belgium.....	6 17½		1.33
Germany.....	6 17½		1.33
¾-in. ship plates:			
Luxemburg.....	6 15		1.36
Belgium.....	6 15		1.36

of the Continental works, and their determination to secure markets at all costs. The British manufacturer cannot live in the face of the fierce competition to which he is subjected, in which connection the following analysis of tenders made this week to the Great Indian Peninsula Railway for miscellaneous stores is an exceedingly illuminating document.

	British Tenders		Continental Tenders	
	Highest	Lowest	Highest	Lowest
Wheels and axles...	£1,350	£920	£800	£678
Steel tires for locomotives .....	1,988	1,891	1,531	1,119
Laminated springs...	2,694	1,717	2,087	1,232
Spring steel.....	2,040	1,463	1,706	978
Bolts, nuts, rivets, etc. ....	299	283	....	206
Brass and iron or steel screws .....	465	437	....	280
Fencing wire strand	808	768	696	528

It may be pointed out that the above figures do not tell the whole tale, either, because sea freights, owing to the rings formed by British shipowners, are much lower from the Continent to India than they are from the United Kingdom to India.

#### High Fuel Costs Largely Responsible

Reviewing the general outlook of the British steel trade, the fundamental trouble is the high cost of fuel. This arises in large part from the determination of the trade unions to force the pace as fast as possible in the way of wages and hours of labor, the result being that today the British collier is probably the least efficient and most highly paid man of his class in the world. Unless our manufacturers are permitted to purchase coal on approximately the same terms as their Continental rivals they unquestionably will be forced entirely out of business sooner or later. Thanks to the excessive cost of fuel in this country, the output

of pig iron and steel has remained practically stationary this year compared with 1923, while at the same time it has increased in Belgium by about 25 per cent, in France by about 36 per cent and in Luxemburg by about 50 per cent.

At the same time our imports of foreign iron and steel have been stimulated by their cheapness, and our exports discouraged, if not rendered impossible. For instance, in the first half of the current year our imports were 77 per cent greater than the monthly average in 1923, while our exports were actually 6 per cent less, while during the same period the exports of France increased by 42 per cent and those of Belgium and Luxemburg by 32 per cent. The increased imports of iron and steel into the United Kingdom indeed go a long way to explain why so many furnaces have been blown out or damped down. The British trade unionist, by his implacable demands and rigid restriction of working conditions, makes it more and more difficult for this country to compete with abroad.

#### Indian Tariff Held Insufficient

According to advices received here from Bombay, the Tata Iron and Steel Co. still is not satisfied with the extravagant measures of protection accorded by the Government. Not content with the liberality shown, that company now is bullying and bull-baiting the authorities for a further immediate increase in the tariff and, as the authorities have not yet fallen down in terror at the threats put across, the Tata Company has decided to shut down a lot of the plant. The fact of the matter is, it is a good deal more than a tariff that the Tata people require if they ever are to become an economic factor in the iron and steel trade. Meantime they have big stocks of material, are closing down their works and stopping construction work.

## GERMANY REPORTS BETTERMENT

### Gradual Improvement in Iron Trade—Germany Negotiating for Foreign Trade Agreements with France and Other States

BERLIN, GERMANY, Oct. 11.—As the possibility that the German currency again will be depreciated to any large extent seems remote, industrial companies are reverting their inflated paper mark capital into gold marks. Naturally the ratio at which this is done varies greatly according to the firms' standings. But there are few that have been able to avert an inflation of the share capital during the last few years and the shareholders have been alarmed at the rigor with which some companies are reducing the capital. Many firms are using the opportunity to consolidate their position by reducing the share capital disproportionately. In many cases the change from paper mark capital into gold mark capital is not simply a reversion from the one into the other in the same proportion as the capital was inflated, but it is used to make allowances for the losses sustained during the last ten years.

Though economic conditions in Germany generally show a tendency to improve, considerable uncertainty prevails. Estimates of the rate of improvement have been too optimistic, especially in regard to the effect of the result of the London Conference. The whole-some effect of the removal of the customs barrier between the occupied area and the other parts of the country has not yet been very marked, but the Ruhr industry gradually is regaining its markets, especially in the Southeast, Austria and the Balkans, and it is winning back its position in the German market also.

#### Buyers Slow in Releasing Orders

In some lines customers still hold back with orders, partly forced by scarcity of funds but generally in the belief that prices will come down further. Reductions are not taking place at the rate expected; in fact, the wholesale price index has increased slightly. Manufacturers in the Rhenish Westphalian industry are optimistic about the development of business in the near future, and production is raised wherever possible. A reduction of coke and pig iron prices is ex-

pected, and seems necessary to bring prices of rolled material down, as manufacturers are handicapped in regard to foreign competition. The development of the labor market also is erratic and the number of unemployed has remained about the same; while there are improvements in some lines, dismissals of workmen take place in others.

Together with the gradual stabilization of economic conditions, the German foreign trade balance is improving. During August the foreign trade shows the same tendency as during July—less imports and more exports. The imports of iron ore have increased slightly. Imports of iron have gone back; pig iron from 34,535 tons during July to 8017 tons during August and semi-finished material, billets, etc., from 96,900 to 10,670 tons. Rolled material and iron goods exports have increased from 90,416 to 114,403 tons.

#### New Trade Relations with France

Among the German industries especially affected by the establishment of new trade relations with France the iron industry occupies an important position, and the iron and engineering industry is following the negotiations with the greatest interest. While the iron mills which buy their raw material in the open markets, and which import a large amount of their requirements from the Saar, Luxemburg and Lorraine, strongly favor unrestricted import of raw material, ingots, billets, etc., the German iron masters claim to be in position to supply the entire demand and therefore favor a protectionist policy. But this would have a price-raising influence on iron goods, and it is the intention of the Government to bring prices generally down. There have been official discussions about a suitable way to force prices down, and it is intended to remove the import restrictions on most goods until January next and to reduce the duty considerably.

The Luxemburg iron industry, which belongs to the Belgian customs union, greatly depends on exports and demands considerable concessions in regard to a trade agreement with Germany. A large amount of Luxemburg iron products is exported to Germany, especially iron ore, pig iron and semi-finished material. Even finished material is sold in large quantities to South Germany, because of the favorable geographic position. On the other hand, Luxemburg requires a



large amount of coal, coke and mining material. It therefore asks for free export of German coal and coke to Luxemburg and also for the free import of its ore and Thomas slag into Germany. It proposes also a reciprocal exemption from import duty for iron products.

#### Ore and Scrap Conditions

Some weeks ago it seemed as if trade on the ore market would become very brisk. But during the last fortnight business has been comparatively slack, though it averages slightly better than during the few months previous. The works are very cautious in placing orders, and are buying only to the extent of regular requirements. Prices are depressed and even foreign suppliers are making concessions. Traders are active in refilling their stocks in the hope of an improvement in the near future. It seems, however, that the recuperation of the German industry will take place only very gradually. Business in Spanish and Wabana ore has been brighter lately but, as the Wabana supply will stop during the winter, importers have made contracts for French ore from Normandy. There is little demand for manganese ore, as prices are considered excessive.

Conditions in the scrap market vary. The improvement which has been expected during the last

few weeks has not taken place. The Micum recently has sold large amounts of scrap, it is said about 75,000 tons, which have a depressing influence on prices.

Market conditions are fluctuating, but an improvement in business is noticeable, though the orders booked are generally not sufficient to keep the works fully employed. The latter show no inclination lately to make concessions in prices. During the last few days considerable export orders have been booked, among which British orders for billets and Swedish purchasers of rolled wire and of sheets are the most noteworthy. Prices have changed little recently and average quotations follow:

	Gold Marks per Metric Ton	Equivalent
Blooms .....	97	\$23.47*
Billets .....	102	24.68*
Sheet bars .....	110	26.62*
Bar iron .....	112	1.21c. per lb.
Structural shapes .....	110	1.19c. per lb.
Universal iron .....	122	1.32c. per lb.
Hoop iron .....	144	1.56c. per lb.
Sheets, heavy .....	130	1.40c. per lb.
Sheets, medium .....	143	1.55c. per lb.
Plates 1 to 3 mm. (No. 19½ to No. 11½ gage) ..	164	1.77c. per lb.
Plates below 1 mm. (No. 19½ gage) .....	173	1.87c. per lb.
Wire, drawn .....	162	1.75c. per lb.

\*Per gross ton.

## OUR MACHINERY IN GERMANY

### European Manufacturers Still Unable to Equal Best United States Production—Sales Prospects for This Country Reported Good

As a buyer of American industrial machinery, Germany, under the Dawes arrangement, takes on new interest, according to W. H. Rastall, chief, Industrial Machinery Division, Department of Commerce, who has recently returned from a trip through Southwestern Europe. Although our exports of such machinery to Germany in recent years have not been heavy, the trade in former years was very large, reaching a total of \$5,259,000 in 1913 when Germany ranked third among all of the markets of the world, only Canada and the United Kingdom enjoying a larger trade, while for metal working machinery Germany ranked first, the total being \$2,280,000 on the average for five pre-war years.

As contrasted with the 1913 total, our shipments of industrial machinery to Germany in 1923 were only \$764,000, of which metal working machinery represented only \$210,000 (and in 1922 only \$77,000). For practically a decade Germany has failed to import American machinery in the way it was done in pre-war days.

To a certain degree the shortage of high-class equipment represented by these figures has been met by German manufacturers who have taken up the production of machinery of the types formerly imported from America, in many instances even flattering American producers by copying their designs. But it should not be inferred that the need for American equipment has been wiped out, as it appears to be agreed by those in the trade that not only are there many classes of American machinery that are not yet produced in Europe, thereby providing American producers with valuable opportunities, but even in the lines produced on both sides of the Atlantic the European manufacturers cannot yet equal the best American equipment. As a consequence, the industries of Germany have developed a long-standing shortage of equipment of the best quality.

It is undoubtedly true that one of the effects of the decline of the mark was to stimulate the construction and extension of factories in Germany, but reports indicate that these new plants are deficient in the high-class equipment that was formerly imported for such purposes and one hears of orders for high-class machinery being placed in America, inquiries are in the market and specialists are being sent to this country to

study what is available here and to buy what is needed.

During recent months certain peculiarities of the German situation have, in large measure, been cleared up and American exporters can now look to the future with greater confidence. Among these is the price situation. Generally speaking, it seems to be clearly established that German costs are now above world market levels, and in cases where machinery has to be built after order the prices will probably be in line with or above quotations from other countries. On the other hand, money is very tight in Germany, and in cases where manufacturers are still carrying stocks produced when the mark was low, distress quotations may be expected.

### Fuller-Lehigh Co. Contract with the Babcock & Wilcox, Ltd.

The Fuller-Lehigh Co., New York, has entered into an agreement with the Babcock & Wilcox, Ltd., London, England, to operate under the Fuller-Lehigh Co. patents, whereby everything in connection with its pulverized coal business will be handled throughout the world by the Babcock & Wilcox, Ltd., with the exception of the United States, its dependencies, Canada and Mexico. The Babcock & Wilcox, Ltd., has taken over a large number of members of the Fuller organization who have specialized for years in work of this kind. The agreement was concluded in July, and since that time the Babcock & Wilcox, Ltd., has secured a number of contracts in various parts of the world to equip boilers to operate with pulverized coal.

A number of lectures of interest to those active in the iron and steel industry are listed in the program of the Mellon Institute of Technical Research, University of Pittsburgh, for the first and second semesters of the University year. The lectures, which are given in the Fellows' room of the Institute on Mondays at 4.30 p. m., are open to all interested in science and technology. Subjects of interest to iron and steel men, the dates and the speakers follow: Nov. 3, "Metallurgical Refractories," M. C. Booz; Nov. 10, "Heat-Insulation Materials," R. H. Heilman; Nov. 17, "Corrosion Preventatives," C. R. Texter; Nov. 24, "Wrought Iron," Dr. B. B. Wescott; Dec. 1, "Protected Metals," Dr. J. H. Young; Dec. 8, "Enameled Cast Iron and Sheet Steel," J. E. Hansen; Dec. 15, "Galvanized Metal Ware," W. G. Imhoff; Jan. 5, "Salt," C. C. Kesler; Jan. 12, "Inks," Dr. F. F. Rupert; Jan. 19, "Wood Preservatives," Dr. A. M. Howald; Jan. 26, "Petroleum Products," Dr. W. A. Gruse; Feb. 2, "Wood Chemicals," R. F. Remler; Feb. 16, "By-Product Coke," O. O. Malleis.

# Iron and Steel Markets

## TWO KINDS OF BUYERS

### Election Hesitation Offset by Willingness to Contract

#### Steel Corporation Firmer on Bars and Structural Shapes—No International Steel Pool

The election continues to influence the steel market, but while some buyers wait, others are acting, and the past week has shown freer contracting on the whole. Railroad demand in particular is keeping up, and at Chicago pig iron purchases have been the largest in weeks.

Announcement of the Steel Corporation's earnings for the third quarter added to the favorable effect of its increased October bookings as published at the Iron and Steel Institute meeting. Independent steel companies, unlike the corporation, did not take more business in the first 17 days of October than in the same period in September, since many of them do not make the railroad products for which the corporation has had large bookings.

Views of leaders in the industry, as expressed at Friday's meeting, agree, however, as to the probable maintenance of the recent improvement. It is believed that the election result will release considerable business, and there is also an increasing inquiry for first quarter material.

For the fourth quarter the Steel Corporation will have a price average several dollars a ton below that of the September quarter. On the other hand, there is the larger output of October and the prospect of continued operation above 60 per cent.

However, the corporation's rail mills will not have early benefit of the large orders recently placed, as rollings will not be called for until the first quarter of next year.

There is evidence of a firmer attitude by the Steel Corporation on bar and structural steel prices, and in some instances quotations have been made representing \$2 a ton advance over the market of two weeks ago. How far this will go is expected to develop more definitely by the middle of November.

The week's additions to rail contracts include 32,000 tons placed by the Erie and 35,000 tons by the St. Paul, the latter going to the two Chicago district mills—27,500 tons and 7500 tons. Track supply orders at Chicago were fully 15,000 tons.

Immediately pending western car orders are 3200 for the Chicago & Northwestern and 1000 each for the Burlington and the Northern Pacific. In the Middle West car repair work for the B. & O. will take 15,000 tons of plates and shapes.

There are clearer indications that freight rate readjustments will result from the new basings for steel. The conference of steel company traffic men at Pittsburgh this week is a first step. The whole rate structure of today is built on Pittsburgh basing and its entire recasting by the Interstate Commerce Commission is predicted.

Among new developments in the price situation is the adding of Ironton, Ohio, to the list of basing points for wire products, making six in all. At Anderson, Ind., on such wire products as the local mill supplies prices are put at \$1 above the Cleveland and Pittsburgh level.

In the sheet trade Ohio mills continue to absorb freight on shipments to the West. On the other hand, a 4000-ton sheet contract that has long gone to the Pittsburgh district has been placed with an eastern mill by a car works in the same section.

Bar iron prices in the Middle West averaged 2.10c. in the 60 days ended Oct. 20, against 2.15c. in the preceding period. Puddlers' wages for November and December are thus reduced to \$11.88 from \$12.23 and bar iron finishers are reduced 2½ per cent.

Decided increase in activity marks the Chicago and Cleveland demand for pig iron on the part of buyers who are confident that the results of the election will be favorable, but in other centers the market is inactive. At Pittsburgh the only inquiry of importance is for 5000 tons of basic. Some furnaces are showing more willingness to sell for first quarter of next year at little, if any, advance over prices for early delivery.

Pig iron output is still increasing. The Steel Corporation has made a large inroad upon its pig iron stocks and will start two or three more furnaces.

A fantastic story of an international steel agreement comes from Berlin. Nothing is known of it here and British steel makers, according to our London cable, regard the idea as impossible. The report may have started from the movement in Germany to form a pig iron and raw steel cartel. This seems likely to be done and the German pig iron price stabilized by cutting down output 25 per cent.

The Hull Corporation, England, has withdrawn its contract with German interests for 1500 tons of tram rails and 500 tons of sole plates and placed it at home at £2,500 higher total.

The Alpine Montan Gesellschaft has banked the only active blast furnace remaining in Austria.

## Pittsburgh

### Fair Amount of Business—Rush of Buying After Election Not Expected

PITTSBURGH, Oct. 28.—Actual requirements of steel are providing producers in this district with a very fair amount of business and the recent rate of plant operation is being maintained without the necessity of laying down much steel. Buyers, however, are cautious and despite the long betting odds quoted on the candidate for President whose election would be favorably regarded, the instances of forward buying are exceptional. The idea that election will be followed by a rush of buying is not very generally held, because the inventory period will be on within a month after the election.

Sentiment is reasonably cheerful in view of the expectation that the outcome of the Presidential campaign



## A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics  
At date, one week, one month, and one year previous

## For Early Delivery

Pig Iron, Per Gross Ton:	Oct. 28, 1924	Oct. 21, 1924	Sept. 30, 1924	Oct. 30, 1923
No. 2X, Philadelphia	\$21.76	\$21.76	\$21.76	\$22.64
No. 2, Valley Furnace	19.50	19.50	19.50	22.50
No. 2, Southern, Cin'tit	21.55	21.55	21.55	23.55
No. 2, Birmingham, Ala.	17.50	17.50	17.50	19.50
No. 2 foundry, Chicago*	20.50	20.50	20.50	24.00
Basic, del'd, eastern Pa.	20.00	20.00	20.00	23.00
Basic, Valley furnace	19.00	19.00	19.00	22.50
Valley Bessemer del. P'gh.	21.76	21.76	21.76	26.76
Malleable, Chicago*	20.50	20.50	20.50	24.00
Malleable, Valley	19.50	19.50	19.50	22.00
Gray forge, Pittsburgh	20.76	20.76	20.76	24.26
L. S. charcoal, Chicago	29.04	29.04	29.04	29.15
Ferromanganese, furnace	95.00	95.00	95.00	110.00

Rails, Billets, Etc., Per Gross Ton:	Oct. 28, 1924	Oct. 21, 1924	Sept. 30, 1924	Oct. 30, 1923
O.-h. rails, heavy, at mill	\$43.00	\$43.00	\$43.00	\$43.00
Bess. billets, Pittsburgh	35.50	35.50	36.00	40.00
O.-h. billets, Pittsburgh	35.50	35.50	36.00	40.00
O.-h. sheet bars, P'gh.	37.00	37.00	37.00	42.50
Forging billets, base, P'gh.	40.50	40.50	42.00	47.50
O.-h. billets, Phila.	41.17	41.17	41.17	45.17
Wire rods, Pittsburgh	45.00	45.00	46.00	51.00

Finished Iron and Steel,	Cents	Cents	Cents	Cents
Per Lb. to Large Buyers:				
Iron bars, Philadelphia	2.32	2.32	2.32	2.67
Iron bars, Chicago	2.10	2.10	2.10	3.40
Steel bars, Pittsburgh	2.00	2.00	2.00	2.40
Steel bars, Chicago	2.00	2.00	2.00	2.50
Steel bars, New York	2.34	2.34	2.34	2.74
Tank plates, Pittsburgh	1.80	1.80	1.80	2.50
Tank plates, Chicago	2.00	2.00	2.00	2.60
Tank plates, New York	1.94	1.94	1.94	2.74
Beams, Pittsburgh	1.90	1.90	2.00	2.50
Beams, Chicago	2.00	2.00	2.00	2.60
Beams, New York	2.14	2.14	2.24	2.74
Steel hoops, Pittsburgh	2.50	2.50	2.50	3.15

Sheets, Nails and Wire,	Oct. 28, 1924	Oct. 21, 1924	Sept. 30, 1924	Oct. 30, 1923
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh.	3.50	3.50	3.50	3.75
Sheets, black, No. 28,				
Ch'go dist. mill	3.60	3.60	4.60	5.00
Sheets, galv., No. 28, P'gh.	4.60	4.60	4.60	5.00
Sheets, galv., No. 28,				
Ch'go dist. mill	4.70	4.70	2.70	3.00
Sheets, blue, 9 & 10, P'gh.	2.70	2.70	2.70	3.00
Sheets, blue, 9 & 10, Ch'go				
dist. mill	2.80	2.80	2.75	3.00
Wire nails, Pittsburgh	2.75	2.75	2.75	3.00
Wire nails, Chicago dist.				
mill	2.85	2.85	2.50	2.75
Plain wire, Pittsburgh	2.50	2.50	2.50	2.75
Plain wire, Chicago dist.				
mill	2.60	2.60	2.45	3.80
Barbed wire, galv., P'gh.	3.45	3.45	3.45	3.80
Barbed wire, galv., Ch'go				
dist. mill	3.55	3.55	\$5.50	\$5.50
Tin plate, 100 lb. box, P'gh.	\$5.50	\$5.50	\$5.50	\$5.50

Old Material, Per Gross Ton:	Oct. 28, 1924	Oct. 21, 1924	Sept. 30, 1924	Oct. 30, 1923
Carwheels, Chicago	\$17.50	\$17.50	\$18.00	\$17.50
Carwheels, Philadelphia	17.50	17.50	18.00	19.00
Heavy steel scrap, P'gh.	19.00	18.50	18.00	15.00
Heavy steel scrap, Phila.	16.50	16.50	17.00	15.00
Heavy steel scrap, Ch'go.	16.50	16.00	16.50	13.50
No. 1 cast, Pittsburgh	18.00	18.00	18.00	18.50
No. 1 cast, Philadelphia	17.50	17.50	18.00	19.00
No. 1 cast, Ch'go (net ton)	17.50	17.50	18.00	18.00
No. 1 RR. wrot. Phila.	17.50	17.50	19.00	17.00
No. 1 RR. wrot. Ch'go (net)	14.50	14.00	15.00	12.00

Coke, Connellsville:	Oct. 28, 1924	Oct. 21, 1924	Sept. 30, 1924	Oct. 30, 1923
Per Net Ton at Oven:				
Furnace coke, prompt	\$3.00	\$3.00	\$3.00	\$3.75
Foundry coke, prompt	4.00	4.00	4.00	4.75

Metals,	Oct. 28, 1924	Oct. 21, 1924	Sept. 30, 1924	Oct. 30, 1923
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	13.50	13.25	13.12½	13.00
Electrolytic copper, refinery	13.25	13.00	12.75	12.35
Zinc, St. Louis	6.52½	6.40	6.15	6.32½
Zinc, New York	6.87½	6.75	6.50	6.67½
Lead, St. Louis	8.75	8.15	7.80	6.45
Lead, New York	9.00	8.25	8.00	6.75
Tin (Strait), New York	52.00	51.00	48.25	41.50
Antimony (Asiatic), N. Y.	11.75	11.75	11.25	8.50

\*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market report on other pages.

## THE IRON AGE Composite Prices

## Oct. 28, 1924, Finished Steel, 2.460c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 88 per cent of the United States output of finished steel.	{	Oct. 21, 1924, 2.460c.
		Sept. 30, 1924, 2.474c.
		Oct. 30, 1923, 2.775c.
		10-year pre-war average, 1.689c.

## Oct. 28, 1924, Pig Iron, \$19.46 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham.	{	Oct. 21, 1924, \$19.46
		Sept. 30, 1924, 19.46
		Oct. 30, 1923, 22.27
		10-year pre-war average, 15.72

1924 to Date	Low	High	1923	Low	High
2.789c., Jan. 15	2.460c., Oct. 14	2.824c., April 24	2.446c., Jan. 2		
\$22.88, Feb. 26	\$19.29, July 8	\$20.86, March 20	\$20.77, Nov. 20		

will be favorable and the fact that following last week's meeting of the American Iron & Steel Institute the abandonment of the Pittsburgh plus method of quoting does not loom up as such a huge problem to independent producers as it did prior to Judge Gary's talk.

Some irregularity still is observed in sheet prices as part of the adjustment of manufacturers whose plants are outside of the Pittsburgh and Chicago districts to the new quoting arrangement. In other directions, however, the change has been largely accomplished. As was the first fear of Pittsburgh district manufacturers, the change has meant the localization of business and until there is enough business to engage the industry of the country to 75 per cent of capacity or beyond, it will

probably be the tendency of consumers to place as much business as possible at their nearest sources of supply. The question to be solved is whether the mills without nearby sources of outlet will be able to get into more distant consuming districts by merely equalizing the delivery prices of the more favorably located producers. The recent increase of \$1 per ton in the price of cold-finished steel bars by the American Steel & Wire Co. has been extended to Worcester, Mass., and there is no longer much concern on the part of local producers over the outside basing points since this revision makes possible shipments from the Pittsburgh district to all consuming districts with a minimum of freight absorption.

While actual quotations show no particular change

from those of a week ago, the statements of earnings of several of the independent companies for the third quarter of the year have been sufficiently unfavorable to create a realization that prices are too low to be profitable. This is being reflected in a little firmer price attitude on the part of producers. On structural shapes there is no longer much disposition to cut under 2c. base, even on reasonably attractive inquiries.

The pig iron market still is distressingly quiet since melters are well covered for the remainder of this year and have not yet evinced much interest in early 1925 supplies. So far as the merchant producers are concerned, all grades of pig iron are priced below cost of production, but in the absence of any considerable demand the cost argument is without effect on prices. Two blast furnaces went on the idle list last week, while one was started up in this district, leaving 73 out of 139 in production. The scrap market has firm undertone, but demands are very limited. The situation in coal and coke is without appreciable change.

**Pig Iron.**—A Pittsburgh district sheet maker who recently bought 2000 tons of basic iron at \$18.50, Valley furnace equivalent, has followed the purchase with an inquiry for 5000 tons for delivery at the rate of 1000 tons a month, starting with November. The lowest price brought out by this inquiry from Valley producers was \$19. We note the sale of a small tonnage of basic iron to another Pittsburgh district sheet maker at \$18.50, Valley furnace equivalent. The Valley market, however, is hardly quotable that low yet, since Valley producers and indeed those outside the Valley have not yet seen fit to meet the lower prices which have resulted either from trade deals or on resale tonnages. There is only a limited interest in Bessemer iron, which continues to be quoted at \$20, Valley furnace. Sales of foundry iron have been entirely in single carload lots. On Valley iron of this grade the market no longer is quotable at above \$19.50, but some of the western Pennsylvania producers still are quoting \$20, furnace, and are able to get that price to points where the freight rate is in their favor. There has been a fair amount of business in low phosphorus iron at prices ranging from \$28 to \$29, Valley furnace, and even \$29.50 for some iron for delivery into the first quarter of next year. Offerings of this grade from the East now are practically nil. The Jones & Laughlin Steel Corporation has taken off a furnace at its Aliquippa works which has been producing ferromanganese and the Jeannette furnace of the Youngstown Sheet & Tube Co. also has gone down since a week ago. The Bethlehem Steel Co. has added a furnace at its Johnstown, Pa., works, now having six of 11 in blast at that plant.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being \$1.76 per gross ton:

Basic .....	\$19.00
Bessemer .....	20.00
Gray forge .....	19.00
No. 2 foundry .....	19.50
No. 3 foundry .....	19.00
Malleable .....	19.50
Low phosphorus, copper free .....	\$28.00 to 29.00

**Ferroalloys.**—Interest in the products under this heading is very limited. Only a few carloads of ferromanganese are sought and these from consumers outside rather than within this immediate district. Not even carloads of 50 per cent ferrosilicon are wanted here just now and the lack of demand has prompted one seller to go as low as \$70 delivered or even less in the hope of creating business. Tonnages of spiegeleisen involving 500 tons or more can be bought at \$30, furnace, for 20 per cent material. Both domestic and British producers of ferromanganese are quoting \$100, but outside of a few carloads of domestic material, no sales are noted at that price and it will be some time before that figure will be general in view of the fact that so much tonnage was booked at lower figures and the low rate of steel works operations in relation to capacity. Prices are given on page 1174.

**Semi-Finished Steel.**—Demands are few and small and prices at best are only appraisals. Rolling billets and slabs are offered at \$35.50 to \$36, forging billets at the usual differential of \$5 per ton over rolling billets and sheet bars at \$37 to \$37.50, but outside of specifications against unshipped tonnages there are only in-

consequential sales upon which to base those prices. The rolling billet price has been shaded materially on sales by local mills to secure tonnages in competitive territory and it is believed that lower prices could be secured locally if a good-sized tonnage was the stake. Sheet bars are quoted at \$37, Pittsburgh, but that price is "good" only in the area where Pittsburgh producers have an advantage over outside mills on freight. The common quotation on wire rods is \$46, base, Pittsburgh, Youngstown or Cleveland, and buyers who have claimed to have lower quotations have been known to pay \$46, especially on small lots for early shipment. On the other hand, producers holding to \$46 and refusing less have lost business. In Pittsburgh the market still appears to be properly quotable from \$45 to \$46, base. Most of such business as there is in pipe skelp is at 1.90c., but there is little business except in deliveries on contracts. Prices are given on page 1175.

**Wire Products.**—The business spigot is open only part way and while the stream of orders is constant enough it lacks volume. There are some instances where buyers have indicated that they had orders to place in the event that the result of the Presidential election is favorable, but as a general rule producers are not looking for a rush of business following the election, because the inventory period will be on a month later and it is expected this will have much bearing on demands over the remainder of the year. Current demands are all for early delivery and there are few producers who have enough forward business to boast about it. Ironton, Ohio, mills have made that center a basing point and are naming the same prices as prevail at Pittsburgh and Cleveland. This makes six mill basing points on wire products that are known and there must be others, since there are delivered prices in some parts of the country that do not yield readily to the application of known freight rates. There is some tendency on the part of mills to withdraw from the districts where they are confronted with heavy loss in equalizing freights with the more favorably located producers. It is the present situation that buyers are going to the nearest source of supply and getting ample service in that direction, and the outside mill not infrequently has to do more than offer supplies at equal delivered prices. Coated nails are weak. Locally, they are not selling much below \$2.10 per base keg, but in outside districts it is said that prices as low as \$1.90, Pittsburgh equivalent, have been encountered. Prices are given on page 1174.

**Rails and Track Equipment.**—Except for the New York Central rail orders local mills have not had much standard rail business. The Pennsylvania Railroad is still to be heard from. There is only a moderate demand for light rails and on billet rails an inquiry for more than a carload usually brings out a price of 1.80c., base. There has been a slightly better inquiry for track supplies, but no large orders have resulted. The real demand for spikes and other track supplies will not develop until the weather is right for rail laying and the railroads are in no hurry to enter orders for supplies not immediately required. Prices are given on page 1174.

**Tubular Goods.**—Butt weld sizes of pipe are moving relatively well, but the only favorable development in oil country goods is that crude oil production is decreasing and this is expected to correct the supply situation in time to bring about a larger drilling campaign and the consequent betterment in the pipe demand for next spring. Improved demand for boiler tubes has not strengthened prices, except to the extent that no additional concessions are being given beyond those recently made. Pipe prices are pretty well established in the various producing centers. Pipe capacity is about 60 per cent engaged, the best showing being in butt weld furnaces. Discounts are given on page 1174.

**Sheets.**—Evidence of localization of business on account of the abandonment of Pittsburgh as a sole basing point on prices is increasing. A local car company with a plant in the eastern part of the State, which formerly placed all of its business with Pittsburgh district mills, placed more than 4000 tons of blue annealed sheets for its Eastern plant with an Eastern producer, who could make a somewhat lower delivered



price than the mill in this district. Youngstown mills are corraling most of the business in that district, and it is noted in the Chicago district the local mills are faring best in the distribution of business. There is some disposition on the part of all mills to hold distant consumers by equalizing freight with the more favorably situated producers, but that is costly and the tendency is to seek orders where the net return is best to the producer. The approach of the election is not without effect upon the general demand, although there is a pretty steady stream of specifications and a fair demand for tonnages for early shipment. Prices are steady here, but rather poorly defined elsewhere because of the conditions produced by the new order of quoting. Plant operations are at about the recent rate of 70 per cent of capacity. Prices are given on page 1174.

**Tin Plate.**—Demands for the remainder of this year already have been specified and there being few demands beyond contracted tonnages the market is very quiet and interest centers on the probable price on first quarter and first half of 1925 tonnages, to be announced soon after election day by the leading interest. There is much speculation, but no definite suggestion that the present price will be changed materially. Current production is slightly above 50 per cent of capacity.

**Cold-Finished Steel Bars and Shafting.**—It develops that the American Steel & Wire Co., in raising its Cleveland base on cold-finished steel bars \$1 a ton, also raised the price a like amount at Worcester, Mass. Shafting is made at neither plant and the company's production of screw stock is not so heavy as to have occasioned the uneasiness that was apparent in independent circles when the Cleveland and Worcester bases were announced. Screw stock and shafting business generally is quiet, with makers in this district still quoting 2.70c., base, and equalizing freights with outside producers when necessary. There is no change in the price of ground shafting. Prices are given on page 1174.

**Iron and Steel Bars.**—Local mills are holding steel bars firmly at 2c., base, and showing no inclination to go below that price even on the business of large consumers. Current demands run small, but they are fairly numerous. Iron bars are unchanged in price, but there is not much activity in them, except for a few purchases in connection with railroad car orders. Prices are given on page 1174.

**Structural Material.**—While it cannot be said that 1.90c. base on large structural beams has disappeared, mills in this district regard 2c. as the price they should get and are not going out so strongly for outside business, which is obtainable only at concessions from that figure. Local fabricating companies are getting a fair run of small orders, but generally business is no better than it usually is at this season. Plain material prices are given on page 1174.

**Plates.**—There is practically no market here at present for plates and prices are very indefinite. The quoted range remains at 1.80c. to 1.90c., f.o.b. Pittsburgh district mills, but there are only small sales upon which to base these prices. Some Eastern producers are quoting a mill base, but more generally the plan is to quote on a Pittsburgh base. Prices are given on page 1174.

**Hot-Rolled Flats.**—The situation does not improve much in strips, particularly in the wider sizes, and some pretty low prices are reported on rim stock, although the leading producer claims to have taken a big tonnage at 2.25c., which would be the regular price for rim stock, with strips at 2.40c., base. Only on the narrow widths, however, is the latter price obtainable. Hoops hold well at about 2.50c., base, and many makers are asking that price for bands. It is expected there will be a close clearance on cotton ties, since the cotton crop is turning out in excess of early estimates. Prices are given on page 1174.

**Cold-Rolled Strips.**—The market is holding well at 4c., base Pittsburgh, and makers here find that the outside basing prices do not necessitate as much equalization of freight as was at first anticipated. There is a very fair business in progress.

**Bolts, Nuts and Rivets.**—While there is some interest in bolts and nuts, it is the experience of most makers that the full quotations are not readily obtained. Rivets are irregular and lately there have been as many sales at \$2.50, base, per 100 lb. for large rivets as at the regular quotation, which is \$2 a ton higher. Prices and discounts are given on page 1174.

**Coal and Coke.**—There is not much activity in coke either furnace or foundry. A southern Ohio furnace interest is seeking 7500 tons for December delivery, but this is the only important inquiry now current, no first quarter negotiations having been actively started. Spot furnace coke still demands from \$3 to \$3.15 per net ton at ovens. There is an ample supply of foundry coke, and while the range is still \$4 to \$4.50 per net ton at ovens, the higher figures are hard to obtain, and producers of special brands who have been quoting as high as \$5.50 lately have not been getting much business. The coal market still refuses to respond in price to a fairly good demand. We still quote mine run steam coal \$1.50 to \$2.10, coking grade \$1.60 to \$1.85; gas coal \$2 to \$2.25; steam slack \$1 to \$1.10, and gas slack \$1.15 to \$1.30.

**Old Material.**—There are possibly three consumers of heavy melting steel who would pay \$19, but none is so eager for supplies just now as to be willing to pay more; on the other hand, current offerings of this grade are not heavy and dealers are not disposed to move their yard holdings at less than a net yard price of \$20. Dealers are trying for \$19.50 on such lots as they can secure without drawing on their yard holdings. There was one sale at slightly under \$19 in the week under review, but there since have been bids of \$19 and that appears to be as low as heavy melting steel can be bought. There is no particular change in the rest of the list. Compressed sheets again have sold at \$17 and those disposed of by the Westinghouse Electric & Mfg. Co. for December shipment must fetch that price or more to show the buyer a profit.

We quote for delivery to consumers' mill in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton	
Heavy melting steel .....	\$19.00
No. 1 cast, cupola size .....	\$18.00 to 18.50
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa. ....	19.00 to 19.50
Compressed sheet steel .....	16.50 to 17.00
Bundled sheets, sides and ends ..	15.50 to 16.00
Railroad knuckles and couplers ..	20.00 to 20.50
Railroad coil and leaf spring ..	20.00 to 20.50
Low phosphorus blooms and bil- let ends .....	23.00 to 23.50
Low phosphorus plate and other material .....	22.00 to 22.50
Railroad malleable .....	16.50 to 17.00
Steel car axles .....	21.00 to 21.50
Cast iron wheels .....	18.50 to 19.00
Rolled steel wheels .....	20.00 to 20.50
Machine shop turnings .....	14.00 to 14.50
Sheet bar crops .....	20.00 to 20.50
Heavy steel axle turnings .....	16.00 to 16.50
Short shoveling turnings .....	14.50 to 15.00
Heavy breakable cast .....	16.00 to 16.50
Stove plate .....	15.00 to 15.50
Cast iron borings .....	14.50 to 15.00
No. 1 railroad wrought .....	15.50 to 16.00
No. 2 railroad wrought .....	19.00

### Nickel Circular Revised

A large amount of recent data on the properties and applications of nickel and its alloys is given in a recently revised edition of the circular on this subject issued by the Bureau of Standards. The circular deals with the sources, metallurgy and refining, and technology of nickel, with the production of commercial forms, and with the metal's various chemical and physical properties. The relation of the physical properties to the composition and treatment of the material is discussed.

Reports have been current in Chicago indicating that the Jones & Laughlin Steel Corporation is starting work on the construction of its steel plant at Hammond, Ind.

## Chicago

### Buying of Pig Iron Heaviest in Weeks—Mills Also Show Gain

CHICAGO, Oct. 28.—Divergent tendencies are to be noticed in the various departments of the iron and steel market as Nov. 4 approaches. While hesitancy still characterizes the attitude of most buyers, there is an increasing propensity to gamble on a favorable outcome of the election. This is particularly noticeable in scrap and pig iron and to a less extent in certain forms of finished products. Purchases of pig iron are the heaviest in weeks and doubtless indicate that a concentration of buying with stronger prices is receiving more than passing consideration as a post-election possibility.

Local mills rolling plates, shapes and bars have shown a gain in both specifications and new business over the previous weeks. Much of this tonnage, of course, is accounted for by orders and releases from railroad car builders. Rail buying is also a factor, the Erie having placed 32,000 tons and the St. Paul a similar tonnage. Fully 15,000 tons of track supplies has been booked by local mills during the week, and orders for rolled steel wheels have been the heaviest in several months. Among other products, steel pipe is showing the most sustained demand. Sheets are quiet but firm, while wire products have not yet found uniform stability, with shading most frequent on cement coated nails. All things considered, both producers and buyers are awaiting developments. While there is talk of price advances, it is predicated on wholesale release of business following the election. There is indeed good reason to expect much delayed buying to ensue, but it is still uncertain what proportions the movement will assume.

Mill operations remain unchanged, ranging from 65 to 80 per cent for the two leading Chicago producers.

**Ferroalloys.**—The market is devoid of features with prices unchanged.

We quote 80 per cent ferromanganese, \$107.56, delivered; 50 per cent ferrosilicon, \$75, delivered; spiegeleisen, 18 to 22 per cent, \$39.56, delivered.

**Pig Iron.**—With the election only one week away, the market is emerging from its sluggishness and is taking on the characteristics of what is expected to be a broad buying movement. Evidently for the purpose of getting covered before conditions justify price advances, a number of large buyers have placed substantial tonnages for both fourth and first quarters. For first quarter alone it is estimated that fully 40,000 tons has been placed. While the open quotation on first quarter delivery is \$21, base furnace, it is understood that most of these melters have succeeded in covering at the current price. Among individual sales are the following: One thousand tons of foundry to a Joliet melter, 1000 tons of foundry to a north Chicago user, 1200 tons of foundry to a southern Wisconsin plant, 1000 tons of foundry to a local melter, 1000 tons of malleable to an eastern Wisconsin user. A radiator manufacturer has placed 2500 tons of foundry with a St. Louis furnace. Pending inquiries include 1500 tons wanted by a central Indiana melter for first quarter and 1000 tons of low phosphorus called for by a Wisconsin consumer. Shipments from local furnaces continue to exceed production and with stocks reduced to a low point the blowing in of one or both Federal furnaces in November is regarded as a likely possibility. Sales of Southern iron have been few, with prices unchanged. Low phosphorus is stronger, the best Chicago delivered quotation being \$33.49. An automobile manu-

facturer is inquiring for 600 tons of silvery for first half.

Quotations on Northern foundry, high phosphorus, malleable and basic iron are f.o.b. local furnaces and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards.

Northern No. 2 foundry, sil. 1.75 to 2.25 .....	\$20.50
Northern No. 1 foundry, sil. 2.25 to 2.75 .....	21.00
Malleable, not over 2.25 sil. ....	20.50
Basic .....	20.50
High phosphorus .....	20.50
Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago ..	29.04
Southern No. 2 (barge and rail)	22.18
Southern No. 2, sil. 1.75 to 2.25 ..	\$23.51 to 24.01
Low phos., sil. 1 to 2 per cent, copper free .....	33.49
Silvery, sil. 8 per cent .....	34.29 to 35.29
Electric ferrosilicon, 14 to 16 per cent .....	42.92

**Plates.**—Both specifications and sales have shown an appreciable gain as compared with the week previous. Much of this business is coming from railroad car builders, but among other classes of users likewise there is less disposition to delay purchases on account of the election. The downward trend in prices seems to have completely stopped and there is talk of possible early advances, although as late as last week an inquiry for 1000 tons of plates brought out a quotation of 1.90c., Chicago. Buying of plates by oil tank fabricators was not a factor during the week, but considerable additional tonnage is said to be in sight.

The mill quotation is 2c. to 2.10c., Chicago. Jobbers quote 3.10c. for plates out of stock.

**Structural Material.**—Outside of the award of the Crane Co. foundry addition, Chicago, 3000 tons, to the Massillon Bridge Co., lettings of fabricated steel have involved comparatively little tonnage. Among immediate prospects the most promising is a new market center for local commission houses dealing in farm produce and poultry, which will be built by the South Water Street Removal Co. This project calls for 15,000 tons. Plain material is steady and mills are considering an early advance.

The mill quotation on plain material is 2c. to 2.10c., Chicago. Jobbers quote 3.10c. for plain material out of warehouse.

**Bars.**—As election approaches the bar market is exhibiting divergent tendencies. Local mills rolling soft steel bars find users specifying more freely, but there continues to be a noticeable propensity to restrict new purchases to immediate requirements until the President has been chosen. On the other hand, the possibility of an early advance in prices is causing some buyers to place substantial orders. The automobile industry is barely holding its own, but the farm implement manufacturers look for at least a moderate improvement in their business during the coming year and are specifying more freely. Betterment in bar iron demand has been maintained, bookings of the past week being equal to those of the week before. The bulk of the tonnage sold has gone at 2.10c., Chicago, although the less desirable orders have commanded as high as 2.15c. Rail steel bar mills have also experienced a heavier demand, particularly from the farm implement industry. Prices, however, are still unsteady, with occasional tonnages moving at as low as 1.90c., mill.

Mill prices are: Mild steel bars, 2c. to 2.10c.; common bar iron, 2.10c. to 2.15c., Chicago; rail steel, 2c., Chicago mill.

Jobbers quote 3c. for steel bars out of warehouse. The warehouse quotations on cold-rolled steel bars and shafting are 3.50c. for rounds and 4.30c. for flats, squares and hexagons; 4.15c. for hoops and 3.65c. for bands.

Jobbers quote hard and medium deformed steel bars at 2.10c. to 2.25c.

**Sheets.**—Although demand cannot be described as pressing, Western capacity is so comfortably booked that there are intimations of an early advance in Chicago district prices.

Chicago delivered prices from mill are 3.65c. for No. 28 black, 2.85c. for No. 10 blue annealed, 4.75c. for No. 28 galvanized. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Jobbers quote f.o.b. Chicago: 3.80c. base for blue annealed, 4.50c. base for black, and 5.50c. base for galvanized.



**Wire Products.**—New business fell off during the week, reflecting increasing hesitancy as election draws near. With prompt deliveries still available from the mills, buyers see no particular advantage in contracting ahead. Trade from manufacturing users is still fairly active and among the common products nails stand out as the commodity of strongest demand. Business in barbed wire and fencing is picking up. Recent orders for rolling stock have resulted in the placing of a number of attractive orders for nails by car builders. Mill operations average from 50 to 55 per cent. Mill prices are fairly steady at the quotations shown on page 1174.

Prices on such products as are manufactured at the American Steel & Wire Co. plant at Anderson, Ind., have been established at \$1 a ton higher than the quotations at Cleveland and Pittsburgh.

We quote warehouse prices f.o.b. Chicago: No. 8 black annealed, \$3.05 per 100 lb.; common wire nails, \$3.15 per 100 lb.; cement coated nails, \$2.40 per keg.

**Bolts, Nuts and Rivets.**—While demand is quiescent pending the Presidential election there are increasing evidences of heavier consumption. Southwestern jobbers who specified liberally in third quarter have been forced to come into the market again to take care of a large increase in their requirements. This reflection of better agricultural conditions in that territory is expected to be duplicated in centers serving Northern and Northwestern sections as crops are cashed in. Bolt and nut quotations are firm, but rivets lack stability, small rivets ranging from 70 and 10 and 5 off to 70 and 10 off. For mill prices see page 1174.

Jobbers quote structural rivets, 3.65c.; boiler rivets, 3.85c.; machine bolts up to  $\frac{3}{4}$  x 4 in., 60 per cent off; larger sizes, 60 off; carriage bolts up to  $\frac{3}{4}$  x 6 in., 55 off; larger sizes, 55 off; hot pressed nuts, squares and hexagons, tapped, \$4 off; blank nuts, \$4 off; coach or lag screws, gimlet points, square head, 65 per cent off.

**Rails and Track Supplies.**—Local mills have had a good week in new business, bookings of rails amounting to 67,000 tons and orders for track supplies amounting to fully 15,000 tons. The Erie has closed for 32,000 tons of rails, of which 18,500 tons was placed with the Carnegie Steel Co., 6000 tons with Illinois Steel Co., the remaining 7500 tons being divided between the Inland and Bethlehem mills. The Chicago, Milwaukee & St. Paul has distributed orders for rails among local producers, the total being 35,000, of which 27,500 was awarded to the Illinois Steel Co. and 7500 to the Inland Steel Co.

Standard Bessemer and open-hearth rails, \$43; light rails, rolled from billets, 1.80c. to 1.90c., f.o.b. makers' mill.

Standard railroad spikes, 2.80c. mill; track bolts with square nuts, 3.80c. mill; steel tie plates, 2.30c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.45c. base, and track bolts, 4.45c. base.

**Cast Iron Pipe.**—With the decline in demand, prices have given way and 6-in. and over is now quoted at \$40 to \$42, base, Birmingham. Dayton, Ohio, has awarded 1150 tons of 16- and 24-in. to the United States Cast Iron Pipe & Foundry Co. The National Cast Iron Pipe Co. will supply 400 tons for Roselle, Ill.; 300 tons for Berkeley, Mich., and 130 tons for Sandusky, Ohio. Detroit takes bids Oct. 31 on 2000 tons of 6-in. Class B pipe.

We quote per net ton, f.o.b. Chicago, as follows:

Water pipe, 4-in., \$52.20 to \$54.20; 6-in. and over, \$48.20 to \$50.20; Class A and gas pipe, \$5 extra.

**Reinforcing Bars.**—A firmer attitude on the part of concrete bar dealers is causing buyers to take advantage of standing quotations, and it is believed that considerable pending tonnage will be closed within the next week or two. While some of the quotations still out range from as low as 2c. to 2.10c., dealers are asking 2.25c., Chicago warehouse, on all new business. Even this price will allow them a margin of only \$5 a ton above the mill quotation to cover handling charges, including cutting, bundling, tagging, bending, engineering service, etc. There is no longer a disposition to sacrifice handling charges in anticipation of further reductions in mill prices. While mill prices may not have yet struck bottom, there is little in the present situation to encourage distributors to count on a further decline.

Lettings include:

Crane Co., foundry addition, Chicago, 250 tons to Kalman Steel Co.

Citizens Gas & Fuel Co., office building, Terre Haute, Ind., 115 tons to Joseph T. Ryerson & Son.

Cluxton Apartment building, Chicago, 100 tons to Concrete Steel Co.

Pending work includes:

First section South Water Street Improvement, Chicago, 820 tons, low bidder on general contract, Mid-Continent Construction Co.

Sewers for City of Minneapolis, 400 tons.

Morrison Hotel addition, Chicago, plans just issued, 250 tons, Holabird & Roche, Chicago, architects.

Austin Y. M. C. A. Building, Chicago, 200 tons.

Oak Park High School addition, Oak Park, Ill., 110 tons.

Hospital addition, Freeport, Ill., 100 tons.

H. W. Caldwell & Sons Co., plant building, Chicago, 100 tons, C. Rasmussen, general contractor.

**Coke.**—Shipments of foundry coke during October have been fully as heavy as in September, indicating sustained melt. In view of favorable weather conditions and prompt transportation service, users are operating on low stocks. Local by-product foundry coke is unchanged at \$10.75 delivered Chicago switching district.

**Old Material.**—In a dealer's market a number of factors have contributed to advances in prices. New supplies of material are coming out slowly and traders are covering their short sales to forestall possible embarrassment if sharp advances occur after the election. There is greater confidence in a favorable outcome of the election and it is anticipated that it will be followed by a concentration of buying by consumers who have held back their purchases. Gradual improvement in steel works operations points to a steady increase in scrap consumption; likewise the blowing out of a blast furnace for rebuilding is expected to force a leading steel mill to buy added quantities of melting steel. Railroad offerings include the Burlington, 9600 tons; Chicago & Alton, 1100 tons; St. Paul, 1000 tons.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

	Per Gross Ton	
Iron rails	\$18.00 to \$18.50	
Cast iron car wheels	17.50 to 18.00	
Relaying rails, 56 and 60 lb.	26.00 to 27.00	
Relaying rails, 65 lb. and heavier	27.00 to 32.00	
Forged steel car wheels	18.50 to 19.00	
Railroad tires, charging box size	19.00 to 19.50	
Railroad leaf springs, cut apart	19.00 to 19.50	
Rolls for rolling	17.25 to 17.75	
Steel rails, less than 3 ft.	18.00 to 18.50	
Heavy melting steel	16.50 to 17.00	
Frogs, switches and guards cut apart	16.75 to 17.25	
Shoveling steel	16.25 to 16.75	
Drop forge flashings	12.00 to 12.50	
Hydraulic compressed sheets	13.00 to 13.50	
Axle turnings	14.00 to 14.50	
Steel angle bars	17.50 to 18.00	
Steel knuckles and couplers	18.00 to 18.50	
Coil springs	19.50 to 20.00	
Low phos. punchings	17.00 to 17.50	
Machine shop turnings	9.00 to 9.50	
Cast borings	11.75 to 12.25	
Short shoveling turnings	11.75 to 12.25	
Railroad malleable	18.50 to 19.00	
Agricultural malleable	17.50 to 18.00	
	Per Net Ton	
Iron angle and splice bars	16.50 to 17.00	
Iron arch bars and transoms	18.50 to 19.00	
Iron car axles	24.50 to 25.00	
Steel car axles	17.00 to 17.50	
No. 1 busheling	12.00 to 12.50	
No. 2 busheling	8.50 to 9.00	
Pipes and flues	11.00 to 11.50	
No. 1 railroad wrought	14.50 to 15.00	
No. 2 railroad wrought	14.75 to 15.25	
No. 1 machinery cast	17.50 to 18.00	
No. 1 railroad cast	16.50 to 17.00	
No. 1 agricultural cast	16.50 to 17.00	
Locomotive tires, smooth	16.50 to 17.00	
Stove plate	14.50 to 15.00	
Grate bars	14.50 to 15.00	
Brake shoes	14.50 to 15.00	

### Youngstown Scrap Market

YOUNGSTOWN, Oct. 28.—There is so little buying of scrap in this district that an appraisal of the market is difficult to obtain. One of the principal melting interests, temporarily out of the market, regards heavy melting firm today at \$18, a price which this same interest considered weak ten days ago. Buying by a Steubenville consumer, desiring prompt delivery, and by the Midland Steel Co. has given sympathetic strength to the scrap market in this territory.

At \$16, hydraulically compressed sheets maintain the usual differential as compared with the price of heavy melting.

## New York

### Business in Pig Iron and Finished Materials Light Preceding Election

NEW YORK, Oct. 28.—Demand for most finished steel products such as plates, bars and sheets is light, due in part to the uncertainties of the election period. It is understood that plates have changed hands at 1.50c., Pittsburgh base, delivered in the East. The Erie Railroad has placed orders for 32,000 tons of rails, understood to be divided up as follows: 15,000 tons to Carnegie Steel Co.; 8000 tons to Bethlehem Steel Corporation; 6000 tons to Illinois Steel Co. and 3000 tons to Inland Steel Co. The St. Paul has ordered about 35,000 tons of rails which are divided between Illinois and Inland Steel companies. The demand for sheets is fair, especially from the automotive industry. Strip steel is more active than for some time. The tendency in wire products is upward.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.34c.; plates, 1.94c. to 1.99c.; structural shapes, 2.14c. to 2.24c.; bar iron, 2.34c.

**Pig Iron.**—There is a marked hesitancy among buyers as to placing business, because of the nearness of election, but there is a fair volume of inquiry for small tonnages and a healthy activity in specifying against contracts is reported. It is estimated that small inquiries of 100 to 200 tons now current in this market total close to 8000 tons and in addition there is the report that a northern New York consumer is in the market for 7000 tons. Eastern Pennsylvania furnaces are evidently well situated until the end of the year and are rather generally holding firmly to the \$20.50 base, one seller quoting \$21 per ton. There is little inclination on the part of sellers to quote for first quarter delivery until after election and buyers also look upon Nov. 4 as a possible turning point in business.

We quote delivered in the New York district as follows, having added to furnace price \$2.27 freight from eastern Pennsylvania, \$4.91 from Buffalo and \$5.44 from Virginia:

East. Pa. No. 2, sil. 1.75 to 2.25	\$22.27 to \$22.77
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	23.27 to 23.77
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	22.77 to 23.27
Buffalo, sil. 1.75 to 2.25	23.41 to 23.91
No. 2 Virginia, sil. 1.75 to 2.25	29.94 to 30.44

**Ferroalloys.**—Sales of several 100-ton lots of ferromanganese are reported at the established quotation. Some sellers also report sales of several carload and small lots, but the market is generally quiet. Demand for spiegeleisen is confined to small and carload lots at no change in regular price.

**Cast Iron Pipe.**—Prices continue unchanged and fairly firm. Buying activity is reported well maintained. The contracts in the Borough of Queens, City of New York, involving about 500 tons of 6-in. and 8-in. water pipe, on which the Department of Water Supply, Gas and Electricity, opened bids last week, were divided between the Melrose Construction Co., New York, and Carmine De Blasio, Mount Vernon, N. Y. We quote, per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, \$56.60 to \$57.60; 4-in. and 5-in., \$61.60 to \$62.60; 3-in., \$71.60 to \$72.60, with \$5 additional for Class A and gas pipe. Jobbers handling soil pipe are buying only for immediate requirements as a rule, although sales are made on a basis of protection against price reductions until the end of the year. The schedule now quoted was effective Oct. 10. We quote discounts of both Northern and Southern makers, f.o.b. New York, as follows: 6-in., 47½ to 57½ per cent off list; heavy, 57½ to 67½ per cent off list.

**Warehouse Business.**—Though reluctance still marks the buyer's attitude, orders appear at a moderate rate and in some products, particularly structural steel, there has been a decided quickening. Prices are firm in sheets, though business in black sheets is quiet. One large house reports that October's business will exceed September's by a good margin. Considerable price cutting is done, especially in bars. Stocks are believed to be reduced considerably, but the practice in most cases has become one of scant buying, which is likely to per-

sist until the political anxieties are over. Inquiries are small but in sufficient volume to maintain a moderate activity. In response to increased demand, lead and solder have moved up 1c., as has straits pig tin. Asiatic antimony is ¼c. higher. Prices in wrought iron and steel pipe are weak, inquiries small and the outlook in doubt. Mill prices on high-carbon steel are softening, but in sheets, structurals, hoops and bands there is a tendency to strengthen at the mills. We quote prices on page 1192.

**Coke.**—Consumers with contracts are reported to be specifying a little more actively and standard foundry is showing more strength than for some time. Furnace coke, however, is still somewhat weak. There is a fair demand for heating coke as the winter approaches. Standard foundry ranges from \$4.25 to \$4.75 per ton and standard furnace from \$3.25 to \$3.50 per ton. By-product is unchanged at \$10.41, Newark and Jersey City, N. J.

**Old Material.**—The market continues quiet and prices generally show a tendency to weakness. No. 1 heavy melting steel is slightly more active than other grades, but prices are unchanged at \$16 to \$17 per ton, the buying prices of brokers, delivered to eastern Pennsylvania consumers. A recent sale of steel car axles at \$22, delivered, to an eastern Pennsylvania user, justifies a quotation at New York of \$18 to \$18.50 per ton. Stove plate continues weak, brokers offering \$14.50 per ton delivered eastern Pennsylvania consumers and \$14 per ton delivered to local New Jersey users. Shipments of cast borings are at present almost exclusively to one eastern Pennsylvania consuming point for which \$13.50 per ton delivered is paid by dealers. Borings and turnings are being purchased at \$12.50 per ton delivered to a consumer taking a low freight rate. Machine shop turnings are holding at \$13.50 per ton, delivered.

Buying prices per gross ton New York follow:

Heavy melting steel, yard	\$12.00 to \$12.50
Heavy melting steel, railroad or equivalent	12.75 to 13.25
Rails for rolling	14.50 to 15.00
Relaying rails, nominal	24.00 to 25.00
Steel car axles	18.00 to 18.50
Iron car axles	26.00 to 28.00
No. 1 railroad wrought	14.50 to 15.00
Forge fire	9.75 to 10.25
No. 1 yard wrought, long	13.50 to 14.00
Cast borings (clean)	9.75
Machine shop turnings	9.50 to 10.00
Mixed borings and turnings	9.25 to 9.75
Iron and steel pipe (1 in. diam., not under 2 ft. long)	11.75 to 12.25
Stove plate	11.00 to 12.00
Locomotive grate bars	11.50 to 12.50
Malleable cast (railroad)	14.00 to 14.50
Cast iron car wheels	14.50 to 15.00
No. 1 heavy breakable cast	11.75 to 12.25

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast	\$16.00 to \$16.50
No. 1 heavy cast (columns, building materials, etc.), cupola size	14.00 to 14.50
No. 2 cast (radiators, cast boilers, etc.)	13.00 to 13.50

### Bequests of Henry R. Towne

In the will of Henry R. Towne, chairman of the Yale & Towne Mfg. Co., whose death was mentioned in THE IRON AGE last week, \$140,000 was bequeathed outright for educational and other public institutions, \$50,000 to the United Engineering Society and the residue of an estate valued at more than \$1,000,000 to an association for the use and maintenance of museums of the peaceful arts. To the Merchants' Association Mr. Towne left \$50,000 and 6000 shares of Yale & Towne Mfg. Co. stock, valued at \$150,000, were set aside as a trust fund for the erection of a service building to be used for the welfare of the company's employees.

Mr. Towne advocates a movement for the creation of a group of buildings in New York for the collection of exhibits, where people shall be inspired to take greater interest in industrial, electrical and other arts. Income from the residuary estate is to be paid to the museums of peaceful arts for the erection of buildings, the fund to be known as the Henry R. Towne Endowment Fund. The bequest made to the United Engineering Society will be held in trust for the Engineering Foundation, and will be used for purposes mentioned in its charter.

SIDE GUIDE AND CRIBBER



## Boston

### Pig Iron Market Appears Firmer Although Business Is Less Active

BOSTON, Oct. 28.—The pig iron market seems firmer, although business is less active. Buffalo furnaces, heretofore exhibiting a firmer market for their product than eastern Pennsylvania, are sticking to regular prices on most transactions. One of them is reported to have closed with a Westfield, Mass., melter on a sizable tonnage of No. 2 plain at about \$24 delivered, or \$19 furnace, a concession of about 50c., but details are withheld. Most Buffalo furnaces are well sold up for 1924 and have a fair tonnage on books for first quarter 1925 delivery. An eastern Pennsylvania furnace heretofore accepting business at \$20.50 furnace base, after taking 600 tons No. 2X from a Massachusetts machinery manufacturer and miscellaneous smaller tonnages, has withdrawn from the market. Buyers report eastern Pennsylvania iron is available at \$20 and \$20.50 furnace base, but such offers now appear outlawed in most instances. Most furnaces offering iron today are \$21 furnace base or \$21.50. Western Pennsylvania No. 2X sold the past week at \$22.50 furnace or \$27.41 delivered, and No. 1X at \$23 furnace or \$27.91 delivered to melters who previously used such iron, but on switching to other brands experienced casting troubles. As a matter of fact a great many New England foundries using new irons are working back to old ones. York State No. 2X and No. 1X sold at \$20 and \$21, furnace, respectively, last quarter, 1924, and first quarter, 1925, delivery. In addition, small tonnages of Alabama sold at full asking prices. Small lots of charcoal and high manganese Buffalo iron figure in the past week's transactions. For the week ending Oct. 18, 853 tons of India iron, heretofore not reported, arrived at this port.

We quote delivered prices on the basis of the latest reported sales as follows, having added \$3.65 freight from eastern Pennsylvania, \$4.91 from Buffalo, \$5.92 from Virginia and \$9.60 from Alabama:

East. Penn., sil. 1.75 to 2.25.....	\$24.65 to \$25.15
East. Penn., sil. 2.25 to 2.75.....	25.15 to 25.65
Buffalo, sil. 1.75 to 2.25.....	23.91 to 24.41
Buffalo, sil. 2.25 to 2.75.....	24.41 to 24.91
Virginia, sil. 1.75 to 2.25.....	29.42 to 29.92
Virginia, sil. 2.25 to 2.75.....	29.92 to 30.42
Alabama, sil. 1.75 to 2.25.....	27.10 to 27.60
Alabama, sil. 2.25 to 2.75.....	27.60 to 28.10

**Finished Material.**—The demand for finished material is somewhat less active, according to a majority of local mill representatives. It is intimated that business is expected to be much better following the Presidential election; that buyers have signified intentions of purchasing more freely following that event. In the meantime, mills are sitting tight on quotations previously named: Bars, \$2.26½ per 100 lb. delivered, freight allowed; shapes, \$2.35½ to \$2.36½; and plates, \$2.01½. Fabricators report a falling off in prospects and keener competition than ever on fabricating bids.

Soft steel bars, \$3.26½ base per 100 lb.; flats, \$4.15; concrete bars, \$3.51½ to \$3.64; structural steel, \$3.36½; tire steel, \$4.50 to \$4.75; open-hearth spring steel, \$5 to \$10; crucible spring steel, \$12; steel bands, \$4.01½ to \$5; hoop steel, \$5.50 to \$6; cold rolled steel, \$4.05 to \$4.55; toe calk steel, \$6; refined iron bars, \$3.26½; best refined bars, \$4.60; Wayne, \$5.50; Norway, \$6.60 to \$7.10; plates, ¼-in. and heavier, \$3.36½; No. 10 blue annealed sheets, \$3.91½; galvanized sheets, \$6 base; black sheets, \$5 base.

**Coke.**—New England makers of by-product foundry coke this month will have shipped more fuel to foundries than in any previous month in a long time. Shipments, however, are still below normal average monthly records of recent previous years. Both the New England Coal & Coke Co. and the Providence Gas Co. continue to do business at \$11.50 a ton delivered in New England, and indications are that will be the price next month, although labor troubles at coal mines possibly may force one New England coke maker to raise prices in November. Indications are coke producers in this section of the country will not open their books for first half 1925 contracts until after the national election. Last year the books were thrown open around Oct. 25.

**Old Material.**—Old material is slightly more active, although business is very spotty. Dealers in general

are indisposed to sell material at going prices, although a little pipe has changed hands the past week at \$11.50 and \$11.85 on cars and some shafting at \$16.50 and \$17 for eastern Pennsylvania and Portland, Me., shipment. Heavy melting steel at \$11.50 and \$12 for eastern Pennsylvania shipment also changed hands, but this class of material is less active than it has been in many weeks. On the other hand, chemical borings at \$12 and \$12.50 on cars have sold in volume, and machine shop turnings are fairly active at \$9. For screw turnings \$9.25 is being paid. Bundled skeleton also is more active, but at a wide range of prices, as little as \$8.60 on cars having been paid in some cases and as high as \$9.50 in others. Some stove plate at \$10 in cars for eastern Pennsylvania shipment also was taken. New England foundries are displaying more interest in No. 1 machinery cast at around \$19 delivered, but the market can hardly be called active.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast.....	\$18.00 to \$19.00
No. 2 machinery cast.....	15.00 to 16.00
Stove plates.....	14.00 to 14.50
Railroad malleable.....	17.00 to 17.50

The following prices are offered per gross ton lots, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel.....	\$11.50 to \$12.00
No. 1 railroad wrought.....	13.00 to 13.50
No. 1 yard wrought.....	12.00 to 12.50
Wrought pipe (1-in. in diam., over 2 ft. long).....	11.50 to 12.00
Machine shop turnings.....	9.00 to 9.25
Cast iron borings, chemical.....	11.50 to 12.50
Cast iron borings, rolling mill.....	8.50 to 9.25
Blast furnace borings and turnings.....	8.50 to 9.00
Forged scrap and bundled skeleton.....	8.60 to 9.50
Shafting.....	16.50 to 17.00
Street car axles.....	16.00 to 17.00
Rails for rolling.....	13.00 to 13.50

## Buffalo

### Business Shows Signs of Improvement After the Election

BUFFALO, Oct. 28.—Furnace interests are encountering improved business conditions and believe that with election over, a great deal more business which is now hanging fire will emerge. The aggregate inquiry for the week was approximately 15,000 to 20,000 tons for last quarter and first quarter delivery. The U. S. Radiator Co. sought and placed between 3000 and 5000 tons for its various plants. The H. B. Smith Co., Westfield, Mass., inquired for between 5000 and 6000 tons, but this is believed to have gone to an eastern Pennsylvania furnace. A 1000-ton foundry inquiry came out of the East and central New York furnished a 1000-ton inquiry. Several 500- and 400-ton lots were sought. On inquiry for the rest of 1924, one local interest is now quoting \$20 base, \$20.50 for 2.25 to 2.75 silicon foundry and \$21.50 for 2.75 to 3.25 silicon foundry. This maker has sold nearly all of its output for the rest of the year and announces it will consider no inquiry under these prices. Other arrangements obtain on first quarter business. Users can still find the \$19 price in the Buffalo territory, and apparently nothing is now being sold under this figure. On the \$19 base's, 2.25 to 2.75 iron can be had at \$19.50 and 2.75 to 3.25 at \$20 to \$21. The Rogers-Brown Iron Co. has placed a third stack in blast.

We quote prices f.o.b. gross ton, Buffalo, as follows:

No. 2 plain, sil. 1.75 to 2.25.....	\$19.00 to \$19.50
No. 1 foundry, sil. 2.75 to 3.25.....	20.00 to 21.00
No. 2 foundry, sil. 2.25 to 2.75.....	19.50 to 20.00
Malleable, sil. up to 2.25.....	19.00 to 19.50
Basic.....	19.00 to 19.50
Lake Superior charcoal.....	29.25

**Finished Iron and Steel.**—Business is marking time, with little important tonnage offering. Bar makers have run into no shading of 2.265c., but no large inquiry has come out to test the market. A few scattering lots are being booked. Sheet prices are about the same, 3.50c. on black and 4.60c. on galvanized. The inquiry is not heavy. The bolt price is steady at 60 and 10 off for large machine, with buyers speculating on the possibility of lower figures in view of bars weakening to 2c. No information of any bolt weakening is apparent now. The impression prevails among steel men that

post-election business will be good if the results of the poll are favorable to business enterprise. They believe there are a great many orders that are sizable that are being held up temporarily. Structural steel fabricators were not active in new business the past week, though they are working steadily on small tonnage orders.

Steel bars, 3.30c.; iron bars, 3.35c.; reinforcing bars, 3.30c.; structural shapes, 3.40c.; plates, 3.40c.; No. 10 blue sheets, 4.05c.; No. 28 black sheets, 4.75c.; No. 28 galvanized sheets, 5.85c.; bands, 4.05c.; hoops, 4.40c.; cold finished rounds, 4.20c.; cold-finished shapes, 4.70c.

**Old Material.**—There has been some buying and the market exhibits a stronger undertone. Two of the larger mills have been purchasing modest tonnages, but no large lots are available. The heavy-melting steel price is about \$16.50 to \$17.50 with hydraulic compressed about \$1 under and No. 1 busheling about 50c. under. There has been a certain demand for these three commodities and one user has been seeking to buy rails. No large tonnage of rails is available. Mill operation throughout the territory is about 65 per cent and even better operation is in prospect for the earlier part of next month, scrap dealers believe.

We quote f.o.b. gross ton, Buffalo, as follows:

Heavy melting steel	\$16.50 to \$17.50
Low phosphorus, 0.04 and under	19.50 to 20.00
No. 1 railroad wrought	15.00 to 15.50
Car wheels	15.50 to 16.00
Machine shop turnings	11.50 to 12.50
Cast iron borings	12.00 to 12.50
No. 1 busheling	15.00 to 16.00
Stove plate	15.50 to 16.00
Grate bars	14.50 to 15.00
Bundled sheets	12.00 to 12.50
Hydraulic compressed	15.50 to 16.50
Railroad malleable	17.00 to 17.50
No. 1 machinery cast	17.00 to 17.50

## Birmingham

### Small Lot Sales of Pig Iron—Buying in Larger Tonnages Soon Is Expected

BIRMINGHAM, ALA., Oct. 28.—Small lots, almost spot business, for delivery practically entirely in the home territory, with now and then a request to hurry on old contracts, tell the story of the present condition of the pig iron market in the South, the quotations still holding at \$18 per ton, No. 2 foundry, with a little tonnage being sold at \$18.50 and even \$19. Inquiries and orders from outside the home territory are not frequent and do not amount to much in tonnage. However, southern furnace interests believe a buying movement is about ready to set in. The Alabama Co., producing machine cast iron, with but one furnace in operation, has been selling at \$19 per ton. The Sloss-Sheffield Steel & Iron Co. one day the past week sold 3500 tons of iron, in lots of various tonnages, at \$18.50. The market appears firm at \$18, No. 2 foundry. Very little iron is being shipped by rail out of this territory.

We quote per gross ton, f.o.b. Birmingham district furnace, as follows:

No. 2 foundry, 1.75 to 2.25 sil.	\$17.50 to \$18.50
No. 1 foundry, 2.25 to 2.75 sil.	18.00 to 18.50
Basic	18.50 to 19.00
Charcoal, warm blast	30.00 to 31.00

**Steel.**—The confusion which followed the change in methods of price making has not entirely disappeared. Fabricators say that there has been some readjustment in prices. Wholesale hardware dealers report readjustment in wire and nail prices, with sales of both commodities showing increase. Engineers are in Birmingham to start work of construction of the steel fabricating plant for the Reeves Brothers Co., of Alliance, Ohio, mentioned heretofore. Upwards of 5000 tons of steel will be used by this concern when in full operation. The Southern Steel Co. is fabricating steel for the National Cast Iron Pipe Co. office building and iron shed, 150 tons in all. Steel bars (soft) are quoted at 2.10 to 2.20c., Birmingham.

**Coke.**—Slight improvement is noted in the coke market here, both as to demand and as to production. The Black Creek Coal & Coke Co. has 60 beehive ovens in operation now, instead of 38, and independent coke producers are shipping steadily outside of the territory.

The Alabama By-Products Corporation has contracts which call for about 1000 tons daily. The coke prices range from \$4.50 to \$5 for foundry grades. Local consumption is steady.

**Pipe.**—Indefinite information includes much tonnage of cast iron pipe, gas and water, for delivery as quickly as it can be tested and loaded. Centrifugal pipe is being produced steadily and is being shipped rapidly, with the old method pipe showing no lagging. The Union Pacific Railroad has announced the placing of an order for 1500 tons of 4-in. and 6-in. pipe in Birmingham, the product to be taken as quickly as the pipe can be delivered. The several plants producing cast iron pipe, and gas and water pipe are operating practically to capacity. Quotations show no change. Soil pipe production is stronger, with prospects still bright.

**Old Material.**—Scrap iron and steel continues dull and quotations weak, dealers delivering on old contracts and selling in small quantities now and then. Heavy melting steel is weak at \$12; in fact, no change has been announced in any direction. Dealers are not speculating on future needs.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Cast iron borings, chemical	\$15.00 to \$16.00
Heavy melting steel	12.00 to 12.50
Railroad wrought	12.00 to 13.00
Steel axles	17.00 to 18.00
Iron axles	19.00 to 19.50
Steel rails	12.50 to 13.00
No. 1 cast	14.00 to 15.00
Tram car wheels	15.00 to 16.00
Car wheels	14.00 to 15.00
Stove plate	13.50 to 14.00
Machine shop turnings	6.00 to 7.00
Cast iron borings	7.00 to 8.00
Rails for rolling	15.00 to 16.00

## St. Louis

### Fair Sales of Pig Iron and Prices Seem Firmer—Rails for Missouri Pacific

ST. LOUIS, Oct. 28.—What is believed to be the largest sale for delivery during the first quarter of 1925 to a melter in the St. Louis district was made by the St. Louis Coke & Iron Co. during the last week, the transaction involving 2500 tons of foundry iron to a central Illinois concern. The local maker's sales totaling 7500 tons also included 3000 tons of basic to an East Side melter for prompt shipment and 500 tons of foundry iron to a stove maker. The principal inquiry is for 500 tons of foundry iron for a local machinery manufacturer. Alternate quotations are asked for last and first quarter delivery with the evident purpose of taking the lower. While quotations are unchanged, the market seems to be firmer, and buyers apparently are more willing to consider their requirements. However, some melters decline to anticipate their needs beyond election day. Orders placed by railroads for rails and cars help to lend strength to the market. A local steel maker is in the market for 100 tons of ferromanganese.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices \$2.16 freight from Chicago, \$3.28 from Florence and Sheffield (rail and water), \$5.17 from Birmingham, all rail, and 81c. average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25	\$22.66 to \$23.16
Northern malleable, sil. 1.75 to 2.25	22.66 to 23.17
Basic	22.66 to 23.16
Southern fdy., sil. 1.75 to 2.25 (rail)	22.67 to 23.67
Southern fdy., sil. 1.75 to 2.25 (rail and water)	20.78 to 21.78
Granite City iron, sil. 1.75 to 2.25	22.31 to 22.81

**Finished Iron and Steel.**—Following the placing of the Wabash Railway inquiry for 15,000 tons of rails, as announced in last week's IRON AGE, the Missouri Pacific Railway has come into the market for 30,000 to 35,000 tons of 85 and 90-lb. rails, with the heavier weight predominating. Delivery is to be during the second and third quarter of 1925. There are no other railroad inquiries of importance before the trade. The general contract for the Bell Telephone Co.'s \$5,000,000 office building has been let to the Westlake Construction Co., but it is understood that bids for the structural steel—



between 7000 and 8000 tons—will not be asked before Jan. 1. Buying in virtually all lines is still exceedingly conservative, but there is buying and the total volume is improving.

For stock out of warehouse we quote: Soft steel bars, 3.35c. per lb.; iron bars, 3.35c.; structural shapes, 3.45c.; tank plates, 3.45c.; No. 10 blue annealed sheets, 4.10c.; No. 28 black sheets, cold-rolled one pass, 5c.; cold rolled rounds, shafting and screw stock, 4.15c.; structural rivets, 3.90c.; boiler rivets, 4.10c.; tank rivets,  $\frac{1}{4}$ -in. and smaller, 60 per cent off list; machine bolts, 55 and 5 per cent; carriage bolts, 40 and 5 per cent; lag screws, 60 and 5 per cent; hot pressed nuts, squares or hexagons, blank or tapped, \$3.50 off list.

**Coke.**—There is a better demand for metallurgical and foundry coke, but the warm weather of the last week has halted the temporary revival of buying of domestic grades by dealers. A refining company bought several hundred tons of coke, and the sale also is reported of several hundred tons to a bakery company.

**Old Material.**—The market for old material is stronger and prices on some items are higher than a week ago, but this is due almost entirely to the activity of dealers rather than to consumers who for the most part are not interested and say they will not be until after the election. Dealers are speculating on what the market will do when the returns are all in, at the same time taking into account that material bought now will hardly be delivered for several weeks. Malleable and cast scrap are in fair demand, and there was some call during the week for rails for rolling. There is a small demand for relaying rails in carload lots. New lists include: Terminal Railway Association of St. Louis, 5335 tons, an unusually large quantity for this company; Union Pacific Railway, 2500 tons, including 1000 tons of mixed scrap; Dodge Brothers, Detroit, 4300 tons; Canadian Northern, 500 tons of 50-lb. relaying rails; Chicago, Burlington & Quincy Railroad, 6500 tons; Chicago, Milwaukee & St. Paul, 900 tons, and St. Louis & San Francisco, 2700 tons.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton		
Iron rails	.....	\$16.00 to \$16.50
Rails for rolling	.....	16.50 to 17.00
Steel rails less than 3 ft.	.....	18.50 to 19.00
Relaying rails, 60 lb. and under	.....	25.00 to 26.00
Relaying rails, 70 lb. and over	.....	32.50 to 33.50
Cast iron car wheels	.....	16.00 to 16.50
Heavy melting steel	.....	14.50 to 15.00
Heavy shoveling steel	.....	14.50 to 15.00
Frogs, switches and guards cut apart	.....	15.75 to 16.25
Railroad springs	.....	18.00 to 18.50
Heavy axles and tire turnings	.....	12.00 to 12.50
No. 1 locomotive tires	.....	16.50 to 17.00
Per Net Ton		
Steel angle bars	.....	14.50 to 15.00
Steel car axles	.....	19.00 to 19.50
Iron car axles	.....	24.00 to 24.50
Wrought iron bars and transoms	.....	18.25 to 18.75
No. 1 railroad wrought	.....	11.50 to 12.00
No. 2 railroad wrought	.....	13.00 to 13.50
Cast iron borings	.....	10.75 to 11.25
No. 1 busheling	.....	12.50 to 13.00
No. 1 railroad cast	.....	17.00 to 17.50
No. 1 machinery cast	.....	17.50 to 18.00
Railroad malleable	.....	14.00 to 14.50
Machine shop turnings	.....	7.00 to 7.50
Champion bundled sheets	.....	8.00 to 8.50

## Cincinnati

### Buying of Pig Iron Confined to Small Lots—Coke More Active

CINCINNATI, Oct. 28.—Little activity is noted in the pig iron market, sales during the past week being confined to small tonnages for prompt shipment. The largest order reported was for 500 tons of Northern iron for last quarter to an eastern Ohio melter on the basis of \$20, Ironton. A local melter bought 300 tons of Southern foundry at \$17.50, Birmingham, for prompt shipment. Other sales included several 100-ton lots of both Northern and Southern brands at prices noted above. There is a little more inquiry for first quarter, two of these involving 3000 tons of malleable, one for 500 tons of foundry, and one for 200 tons of foundry and 100 tons of silvery. It is reported that a number of large consumers have been quietly buying iron for

the past week or ten days, among them a large manufacturer of radiators with plants scattered throughout the country.

Based on freight rates of \$4.05 from Birmingham and \$2.27 from Ironton we quote f.o.b. Cincinnati:

Southern fdy., all. 1.75 to 2.25 (base)	.....	\$21.55 to \$22.05
Southern fdy., all. 2.25 to 2.75	.....	22.05 to 22.55
Southern Ohio silvery, 8 per cent	.....	31.77
Southern Ohio fdy., all. 1.75 to 2.25	.....	22.27
Southern Ohio, basic	.....	31.77
Southern Ohio malleable	.....	22.27

**Finished Materials.**—The demand has about kept pace with that of the previous week, but is not up to the volume of the first two weeks of the month. Railroads have been placing orders for plates and shapes for car repair work, but the bar market is unusually quiet. There has also been some plate and shape buying for highway bridges, but the tonnages usually are small. Prices are practically the same as quoted last week, going orders bringing for plates, 1.85c. to 1.90c., Pittsburgh; for shapes, 1.95c. to 2c., Pittsburgh, and for bars, 2c., Pittsburgh. It is possible to shade these minimum prices \$1 per ton for attractive specifications. From reports gathered from competitive territory, prices of the heavier products from Chicago district are fairly steady at 2c., Chicago. There is little activity in wire products, and prices are unchanged at \$2.50, mill, for plain wire and \$2.75 per keg, mill, for wire nails. Inquiry for specialties is light. The Hamilton County (Ohio) commissioners opened bids this week on sewerage projects and water works extensions involving several thousand tons of cast iron pipe.

**Railroad Spikes.**—The Louisville & Nashville Railroad has closed for 13,000 kegs of track spikes, the order going to a Pittsburgh district manufacturer at a reported price of \$2.60 per keg. A quotation of \$2.65 failed to get the order.

**Structural Activity.**—Small tonnages are the rule, and most of the activity centers on highway bridge work. The Mississippi River Commission will take bids on 17 barges for the first and second districts, involving 2100 tons of steel.

**Reinforcing Bars.**—The only important award was of 250 tons to Truscon Steel Co. for the Scioto County (Ohio) Courthouse. The Clark Co. (Ohio) Tuberculosis Sanitarium will require 200 tons, an apartment building at Louisville, Ky., 150 tons, and a dormitory at the Murray, Ky., Normal School, 150 tons. The Holy Family Congregation, Cincinnati, has taken out a building permit for a school involving about 100 tons. Prices of reinforcing bars are generally quoted from 1.90c., mill, for rail steel to 2.05c., mill, for new billet stock.

**Warehouse Business.**—Local jobbers are optimistic over the prospects as business this month has been considerably heavier than in September. Prices are steady, no changes having occurred during the past week.

Cincinnati jobbers quote: Iron and steel bars, 3.30c.; reinforcing bars, 3.30c.; hoops, 4.35c.; bands, 3.95c.; shapes, 3.40c.; plates, 3.40c.; cold-rolled rounds, 4.05c.; cold-rolled flats, squares and hexagons, 4.55c.; open-hearth spring steel, 4.75c. to 5.75c.; No. 10 blue annealed sheets, 3.90c.; No. 28 black sheets, 4.60c.; No. 28 galvanized sheets, 5.75c.; No. 9 annealed wire, \$3.15 per 100 lb.; common wire nails, \$2.15 per keg base; cement coated nails, \$2.35 per keg.

**Tool Steel.**—With a slight improvement noted in manufacturing activities, there is a corresponding increase in the demand for tool steels, but orders continue small for immediate needs. Prices unchanged, 18 per cent tungsten high speed steel being quoted from 70c. lb. to 95c. lb.

**Sheets.**—Mill operations in this district are running close to 75 per cent of capacity, and indications point to this rate being maintained. However, buying has slackened slightly, due to general pre-election dullness. Competition for business is keen, and some price shading is reported. The market generally is quoted at 2.60c. for blue annealed, 3.40c. to 3.50c. for black and 4.40c. to 4.60c. for galvanized, Pittsburgh, though it has become a current practice to make quotations at mill instead of a delivered price figured from Pittsburgh district mill prices.

**Coke.**—Foundry coke is moving in better volume, largely on account of the desire of foundrymen to lay in a supply for the winter months. There is, however, a slight improvement in the melt of pig iron. Domestic grades are becoming more active, but furnace grades are quiet. By-product prices for November will be unchanged and while there is talk of advances on foundry grades from some districts, nothing along this line has been done.

**Old Material.**—A fairly large tonnage of heavy melting steel has been bought by a consumer in this district at around \$17, delivered, and this has stiffened the price somewhat. Other grades, however, remain dull and prices are nominal and unchanged.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

Per Gross Ton	
Heavy melting steel.....	\$13.50 to \$14.00
Scrap rails for melting.....	12.00 to 12.50
Short rails.....	16.00 to 16.50
Relaying rails.....	28.50 to 29.00
Rails for rolling.....	14.00 to 14.50
Old car wheels.....	13.00 to 13.50
No. 1 locomotive tires.....	14.50 to 15.00
Railroad malleable.....	14.50 to 15.00
Agricultural malleable.....	13.00 to 13.50
Loose sheet clippings.....	9.50 to 10.00
Champion bundled sheets.....	10.50 to 11.00
Per Net Ton	
Cast iron borings.....	9.00 to 10.00
Machine shop turnings.....	8.50 to 9.00
No. 1 machinery cast.....	17.50 to 18.00
No. 1 railroad cast.....	15.00 to 15.50
Iron axles.....	20.50 to 21.00
No. 1 railroad wrought.....	10.00 to 10.50
Pipes and flues.....	7.00 to 7.50
No. 1 busheling.....	9.50 to 10.00
Mixed busheling.....	7.50 to 8.00
Burnt cast.....	9.50 to 10.00
Stove plate.....	9.50 to 10.00
Brake shoes.....	11.00 to 11.50

## Cleveland

### Increased Interest in Pig Iron—Steel Bar Market Firmer

CLEVELAND, Oct. 28.—Steel consumers are marking time until after election and buying only what they absolutely need. However, the demand keeps up to about the volume of the past few weeks. If the outcome of the election is as generally expected, mills look for not only an immediate spurt in buying but to releases of orders that have been held back and also to a permanent improvement in business. The outstanding feature of the price situation during the week was the stiffening of the steel bar market. Quotations of 1.90c., Pittsburgh, that have been appearing in this territory seem to have entirely disappeared and the market appears now to be holding firmly to 2c. Efforts are also being made to hold structural material to the 2c. Pittsburgh base. The weakness in plates and several other finished lines still exists. There is lack of uniformity in the method of quoting prices which is resulting in a variety of prices at delivery points. The Baltimore & Ohio Railroad has inquiries out for car repair work that will require 15,000 tons of plates and structural material. This work is being figured on by car shops in this territory. Railroads in this district have not yet taken up their 1925 rail requirements. The Mobile & Ohio Railroad has placed four locomotives with the Lima Locomotive works, steel for which has been divided among several mills. In the structural field there is an improvement in inquiry. In the Lake building industry one live inquiry is pending for a freight boat requiring 5000 tons of steel and boat repair work is pending that will require 500 tons of plates. Detroit automobile manufacturers, profiting from their over-production experiences of earlier in the year, are reported to be following the policy of manufacturing cars during the remainder of the year only in sufficient quantities to meet the immediate demand and they are buying steel only as needed.

**Pig Iron.**—The market showed increased activity during the week in first quarter contracts and inquiries.

Some consumers are buying now, apparently looking for a possible advance in prices after election, and others are getting quotations with a view of placing their orders after election, provided they regard the result as favorable to business. One Cleveland interest operating several furnaces that had previously refused to sell first quarter iron opened its books during the week and took contracts for that delivery for 8000 to 10,000 tons of foundry iron, much of it in Cleveland and vicinity and in lots up to 3000 tons. Other producers sold very little iron during the week but received first quarter inquiries aggregating 15,000 to 20,000 tons. Little effort has been made to get higher than prevailing prices for the first quarter and the sales have been made at \$20, except for iron sold by local furnaces for Cleveland delivery, which brought \$20.50. On foundry iron for current shipment, \$19.50 seems to have become a more common Valley price, although small lot sales are being made at \$20. However, there are unconfirmed reports of a \$19 Valley price. The Cleveland range for outside shipment is \$19.50 to \$20, although the lower price might not be the minimum to competitive points. An inquiry for 5000 tons of basic iron from a western Pennsylvania consumer brought out a \$19 quotation from a Cleveland producer, but the consumer expected to get an \$18.50 price elsewhere. Business has slowed down with some foundries and some of these have held up shipments. Malleable foundries are not doing so well as the gray iron plants. Practically none of the first quarter business is coming from the automotive industry. Some of the automobile foundries have been operating at very limited extent for several months and will carry over until next year considerable iron bought this year when the automobile industry was going strong. The Bourne-Fuller Co. will blow in its furnace in Cleveland about Nov. 1. This has been out for re-lining.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a \$3.02 freight rate from Jackson and \$6 rate from Birmingham:

Basic, Valley furnace.....	\$19.00
N't'n No. 2 fdy., sil. 1.75 to 2.25.....	21.00
Southern fdy., sil. 1.75 to 2.25.....	\$23.51 to 24.00
Malleable.....	21.00
Ohio silvery, 8 per cent.....	31.52
Stand. low phos., Valley furnace.....	28.00 to 28.75

**Semi-Finished Steel.**—The Youngstown price on slabs and heavy billets has been marked down 50c. a ton to \$35.50, meeting the reduction made in Pittsburgh, but on sheet bars and light billets Youngstown mills are still holding to \$37. In Cleveland prices are unchanged at \$37 at mill for billets and \$37.50 for sheet bars and slabs. No sales are reported.

**Steel Bars, Plates and Structural Material.**—With a firming up of the steel bar market, the price is holding to 2.19c., Cleveland. The plate market continues weak with quotations ranging from 1.80c. to 1.90c., Pittsburgh. On structural material, 2c. Pittsburgh is the prevailing price.

Jobbers quote steel bars, 3.10c.; plates and structural shapes, 3.20c.; No. 28 black sheets, 4.35c.; No. 28 galvanized sheets, 5.45c.; No. 10 blue annealed sheets, 3.45c. to 3.60c.; cold-rolled rounds, 3.90c.; flats, squares and hexagons, 4.40c.; hoops and bands, 1 in. and wider and 20 gage or heavier, 3.85c.; narrower than 1 in. or lighter than No. 20 gage, 4.35c.; No. 9 annealed wire, \$3.05 per 100 lb.; No. 9 galvanized wire, \$3.50 per 100 lb.; common wire nails, \$3.25 base per 100 lb.

**Sheets.**—There is more of a disposition among leading manufacturers to hold to 3.50c. for black, 4.60c. for galvanized and 2.60c. for blue annealed sheets, although some mills will take orders \$2 a ton lower and greater concessions are reported on blue annealed sheets. The volume of business is light. Most mills are quoting delivered prices based on the Pittsburgh price plus Pittsburgh freight to destination.

**Hot-Rolled Strips.**—Wide strip steel continues weak with base prices ranging from 2.10c. to 2.20c., Pittsburgh, although a desirable order would probably bring out a 2c. price. Net prices are often quoted and in some cases part of the extras are being waived. Narrow bands range from 2.30c. to 2.40c. Hoops are unchanged at 2.50c.

**Reinforcing Bars.**—The Cleveland Union Terminal Co., which recently inquired for 19,000 tons of rein-



forcing bars for delivery over a period of five years for use in the Cleveland Union Station project, has rejected all bids and has advised mills that it will shortly send out a new inquiry for several hundred tons covering only its requirements for this year. New inquiry is light. The Kolman Steel Co. has taken 375 tons for a building for the Erie Lithograph & Printing Co., Erie, Pa. The rail steel bar market lacks strength. While 1.90c. Pittsburgh is the common quotation, a fair sized lot would bring out \$1 a ton concession.

**Bolts, Nuts and Rivets.**—Specifications on bolt and nut contracts are good, although some consumers have not yet used up the bolts purchased at the low prevailing prices in the third quarter. Prices are firm. Rivets are not active and there is considerable irregularity in small rivets. The cap set screw market is badly upset because of what is characterized as a price war that is being indulged in by some manufacturers and regular quotations have been reduced 10 to 15 per cent. The new discounts given on page 1175 apparently do not represent the extreme prices.

**Iron Ore.**—Stocks of Lake Superior ore on docks and in furnace yards indicate that as a result of the drastic cut in ore shipping schedules with the slowing down of the iron and steel industry early in the year, the ore movement has been curtailed to about the same extent as consumption. Consequently it is not expected that stocks at the close of navigation Dec. 1 will be much, if any, larger than on the same date last year. The ore on hand at furnaces and Lake Erie docks Oct. 1, 38,997,921 tons, was only 1,500,000 tons more than on the same date last year. On Dec. 1 last year, there was 42,836,466 tons of ore on docks at furnace yards as compared with 44,400,201 tons on the same date in 1922. More ore boats are being laid up for the season and the November movement will be very light, although some shippers will be unable to clean up as soon as they expected because a few furnaces that have blown in recently are holding back on shipments until they get some of their ore used up. Of the total consumption of 2,927,102 tons of Lake Superior ore during September, interior furnaces in the central district consumed 1,599,663 tons, an increase of 141,380 tons over August, Lake front furnaces used 1,194,434 tons, a gain of 136,970 tons for the month, Eastern furnaces consumed 63,717 tons, an increase of 16,408 tons and all-rail furnaces melted 69,288 tons, a loss of 4315 tons.

**Coke.**—Heating coke is firmer with quotations ranging from \$2.85 to \$3.35. Standard Connellsville foundry coke is quiet and unchanged at \$4 to \$5.50, Connellsville basis. On Ashland by-product foundry coke \$6.50, Connellsville basis, has been named as the November price or the same as this month. A northern Ohio maker is holding by-product foundry coke at \$6.50 at ovens.

**Old Material.**—There is a limited demand from dealers for scrap for a Cleveland consumer and small lot purchases are being made at \$15.75 delivered for heavy melting steel and \$13.50 to \$14 for borings and turnings. Generally the market is very dull and there is not enough business to test prices. In the Valley district, dealers are not offering above \$17.50 for heavy melting steel. Mills are not buying and the trade does not look for a more active market until after election. Quotations are unchanged.

We quote dealers' prices f.o.b. Cleveland per gross ton:

Heavy melting steel.....	\$15.50 to \$15.75
Rails for rolling.....	15.75 to 16.00
Rails under 3 ft.....	17.00 to 17.50
Low phosphorus melting.....	17.75 to 18.00
Cast iron borings.....	13.25 to 13.50
Machine shop turnings.....	13.00 to 13.25
Mixed borings and short turnings.....	13.25 to 13.50
Compressed sheet steel.....	13.25 to 13.50
Railroad wrought.....	13.50 to 13.75
Railroad malleable.....	17.75 to 18.25
Light bundled sheet stampings.....	12.50 to 12.75
Steel axle turnings.....	12.25 to 13.50
No. 1 cast.....	18.50 to 18.75
No. 1 bushelling.....	13.00 to 13.25
Drop forge flashings.....	11.25 to 11.50
Railroad grate bars.....	12.25 to 13.50
Stove plate.....	13.25 to 13.50
Pipes and flues.....	11.00 to 11.50

## Philadelphia

### Business Shows Moderate Improvement While Awaiting Election

PHILADELPHIA, Oct. 28.—While transactions in the iron and steel market in this district still are limited almost exclusively to cover immediate requirements, a better tone has developed. Being on the eve of the Presidential election, the political situation is reflected in the pause in industry which is awaiting the outcome and the establishing of stable conditions before it moves forward. But it is believed that within a short time after election, if it carries assurance to business, much improvement in trade will take place.

At the same time, the improved business feeling has to some extent discounted the political situation and orders have been placed in many lines in a somewhat greater volume than during the previous week. Even the plate market, which remains weak, has improved and some makers report business during the past week was on a par with the week preceding, which was the best since last February. The market for shapes is fair while that for bars is slightly stronger.

Moderate business has been done in pig iron, but prices are unchanged. Furnaces are receiving more inquiries for first quarter and while not inclined to quote generally, are naming prices 50c. above the current figures to regular customers.

**Pig Iron.**—Moderate tonnages of foundry iron have been sold by furnaces in this district the past week, with prices of this and the other grades remaining unchanged. A fair percentage of the iron sold has gone to New England consumers. The Pennsylvania Railroad has put out two inquiries for from 500 to 1000 tons each of foundry iron for first quarter delivery, the business to be closed on Nov. 1. Furnaces still are disinclined to quote freely beyond the last quarter, for which period some are comfortably booked, but are naming figures for desirable business. The first quarter business so far as quoted takes an increase of 50c. a ton over that for the last quarter. Low phosphorous iron continues to be quoted at \$24, furnace, for both copper free and copper bearing grades, for nearby shipment, while business for more distant delivery can be placed at a reduction of 50c. at the furnace. Imports of pig iron to this district the past week consisted of 300 tons, which came from England.

The following quotations are, with the exception of those on low phosphorous iron, for delivery at Philadelphia and include freight rates varying from 76c. to \$1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.....	\$21.26 to \$22.13
East. Pa. No. 2X, 2.25 to 2.75 sil.....	21.76 to 22.63
East. Pa. No. 1X.....	22.26 to 23.13
Virginia No. 2 plain, 1.75 to 2.25 sil.....	23.17 to 23.67
Virginia No. 2X, 2.25 to 2.75 sil.....	23.67 to 24.17
Basic delivered eastern Pa.....	20.00 to 21.00
Gray forge.....	21.00 to 22.00
Malleable.....	22.00 to 22.50
Standard low phos. (f.o.b. furnace).....	23.50 to 24.00
Copper bearing low phos. (f.o.b. furnace).....	23.50 to 24.00

**Plates.**—A prominent maker of plates in this district reports improvement in bookings. The volume of orders aggregated as much as that of the week preceding, which was the best week since last February. Purchases being made come from miscellaneous sources, some of them being for repairs to locomotives and cars. The business placed does not represent heavy tonnages, but does reflect an improvement which mills believe will continue. Prices remain unchanged at 1.60c. to 1.65c., Pittsburgh.

**Structural Material.**—While increased activity has been noted the past week in the market for shapes, it was only of a moderate character. Quotations still range from 1.80c. to 1.85c., Pittsburgh. Pat McGovern, general contractor, New York, was the lowest bidder on the second section of the Broad Street subway, which will require 10,000 tons of steel, but it was not known here whether the steel award had been made.

**Bars.**—Makers of steel bars report the market strong at 2c., Pittsburgh. New business, however, calls for only comparatively small tonnages. The nominal quotation on iron bars also is 2c., Pittsburgh.

**Billets.**—Rerolling billets are quoted at \$36, but the market is sagging and it is understood that the price could easily be shaded \$1 on attractive business.

**Sheets.**—The sheet market is rather weak and blue annealed No. 10 is quoted by makers in this district at the Pittsburgh equivalent of 2.60c., while black No. 28 and galvanized sheets are quoted at 3.50c. and 4.60c., Pittsburgh.

**Ferroalloys.**—Small tonnages of ferromanganese have been sold in this district the past week. Both foreign and domestic alloy is quoted at \$100, the former at seaboard and the latter at furnace. Spiegeleisen continues to be quoted at \$31 to \$32, furnace.

**Warehouse Business.**—Warehouse business is somewhat more brisk, with prices unchanged. Steel bars are in more active demand than any other single line.

**Old Material.**—The market for scrap has developed a slightly firmer tone, with an increase of 50c. a ton in some grades, although a decline of the same amount has taken place in railroad grate bars and stove plate. Small sales of heavy melting scrap to Eastern mills the past week were made at \$17.50 per ton, an upward swing of 50c., but today the market dropped back on the strength of small transactions at \$16.50 to \$17,

which still represents the market. There also was a sale of a small lot of this grade at \$16.75. Mills are buying only on a hand-to-mouth basis, but it is notable that dealers are less inclined to sell at present prices than they were recently, and they say the market is developing a little more strength. Machine shop turnings have moved up to a range of \$13.50 to \$14.

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel.....	\$16.50 to \$17.00
Scrap rails .....	16.50 to 17.00
Steel rails for rolling.....	18.50
No. 1 low phos., heavy 0.04 and under .....	21.00 to 21.50
Couplers and knuckles.....	20.00 to 20.50
Rolled steel wheels.....	20.00 to 20.50
Cast-iron car wheels.....	17.50 to 18.00
No. 1 railroad wrought.....	17.50 to 18.00
No. 1 yard wrought.....	16.50 to 17.00
No. 1 forge fire.....	14.00 to 14.50
Bundled sheets (for steel works)	13.50 to 14.00
Mixed borings and turnings (for blast furnace use).....	12.50 to 13.50
Machine shop turnings (for steel works use) .....	13.50 to 14.00
Machine shop turnings (for rolling mill use).....	14.00 to 14.50
Heavy axle turnings (or equivalent) .....	15.00 to 16.00
Cast borings (for steel works and rolling mills) .....	14.00
Cast borings (for chemical plants)	16.50 to 17.00
No. 1 cast.....	17.50 to 18.00
Heavy breakable cast (for steel plants) .....	16.00 to 16.50
Railroad grate bars.....	14.50
Stove plate (for steel plant use)	14.50
Wrought iron and soft steel pipes and tubes (new specifications)	16.50 to 17.00
Shafting .....	24.00 to 25.00
Steel axles .....	24.00 to 25.00

## STEEL CORPORATION EARNINGS

### For Fifth Time Extra Dividend Is Declared on Common

#### Slight Decline in August and Increase in September—Deficit for the Quarter—Judge Gary's Statement

For the fifth time an extra dividend of  $\frac{1}{2}$  per cent on the common stock was declared by the United States Steel Corporation, in its announcement on Tuesday afternoon of the earnings for the third quarter of 1924. Similar action was taken on the third and fourth quarters of last year and the first and second quarters of this year.

The earnings for the third quarter were considerably lower than for the second, being \$30,718,415 compared with \$41,381,039, and they were even lower when compared with the third quarter of 1923, which showed \$47,053,680. The remaining surplus for the nine months ending Sept. 30, after all dividends were paid, including the extra, was \$25,171,601. July, with earnings of \$11,096,288, was indicated as the best month of the quarter. August showed a slight decline, but September registered an increase in earnings.

Earnings for the three quarters of 1924 and the three preceding years were as follows:

Quarters	1924	1923	1922	1921
First.....	\$50,075,445	\$34,780,069	\$19,339,985	\$32,286,722
Second....	41,381,039	47,858,181	27,286,945	21,892,016
Third.....	30,718,415	47,053,680	27,468,339	18,918,058
Fourth....	.....	49,958,980	27,552,392	19,612,033
	\$179,650,910	\$101,647,671	\$92,708,827	

#### Judge Gary's Remarks

After the financial statement had been issued Judge Gary talked about business and political conditions. He said in part:

"I undertook to say last Tuesday at the meeting of the American Iron and Steel Institute what I believe are the qualifications for President of the United States. If any candidate shall be decided by a majority of the voters of this country to measure up to those qualifications and will act accordingly, I think we should expect material increase in the volume of business and steady growth toward prosperity, which would be satisfactory to everyone.

"Just at the present time, less than a week before election, there is in the minds of business men generally

a feeling of anxiety concerning the possible election results, and the purchases which are being made in the iron and steel industry are made only by those who are pretty certain in regard to the results or by those who are buying to satisfy their actual and everyday necessities.

"Our bookings up to Oct. 24 are larger per day than they were at the same date last month. Our selling prices are not quite so large as they were the same period last month and that is the reason why our earnings for the last quarter were somewhat less than our earnings for the next preceding quarter. The conditions, as shown, to my mind demonstrate that the purchasing power and disposition of the purchasing public are strong and vigorous and will in the near future materially increase."

#### Earnings for Third Quarter

	Earnings Before Charging Interest on the Subsidiary Companies' Bonds Outstanding	Less: Interest on the Subsidiary Companies' Bonds Outstanding	Balance of Earnings
July, 1924.....	\$11,096,288	\$666,183	\$10,430,105
August, 1924.....	10,773,079	665,394	10,107,685
September, 1924..	10,845,693	665,068	10,180,625
	<u>\$32,715,060</u>	<u>\$1,996,645</u>	
Total earnings after deducting all expenses incident to operations...			\$30,718,415
Less charges and allowances for depreciation, depreciation and extraordinary replacement funds and sinking funds on bonds of subsidiary companies .....		\$8,277,805	
To sinking funds on U. S. Steel Corporation bonds .....		2,575,708	
		<u>10,853,513</u>	
Net income .....			\$19,864,902
Deduct: Interest for the quarter on U. S. Steel Corporation bonds outstanding .....		\$4,536,792	
Premium on bonds redeemed.....		250,000	
		<u>4,786,792</u>	
Balance .....			\$15,078,110
Dividends on stocks of the United States Steel Corporation, viz.:			
Regular—Preferred, 1¼ per cent...	\$6,304,919		
Common, 1¼ per cent.....	6,353,781		
	<u>\$12,658,700</u>		
Extra—Common, ½ per cent.....	2,541,512		
		<u>15,200,212</u>	
Deficit for the quarter.....			\$122,102
Balance of surplus for 6 months ending June 30, 1924.....			25,293,703
Balance of surplus for the 9 months ending Sept. 30, 1924 .....			<u>\$25,171,601</u>



## STEEL COMPANY EARNINGS

### Statements Show the Seriousness of the Depression of Last Summer

Statements of earnings made public during the past week show how widespread was the summer depression in the iron and steel industry. Losses were numerous and substantial, and where surplus was shown it was pretty lean compared with other quarters.

In its earnings statement for the third quarter, the Bethlehem Steel Corporation showed a much diminished net income, due to the low scale of operations which was general in the steel industry in the summer. The company earned slightly more than \$100,000 over its fixed charges, depreciation and depletion reserves during the period. This compares with a net income of \$1,278,277 after the same deductions in the second quarter. The quarterly dividends were declared on both classes of preferred stock, payable Jan. 2.

The total income in the third period amounted to \$6,495,731, about \$1,000,000 below that for the second quarter and about \$4,000,000 under the first quarter figure. With interest deducted and provision made for reserves, there remained \$102,167, against \$1,278,277 in the previous period and \$4,519,875 in the first quarter. The payment of \$1,075,129 preferred dividends leaves a deficit for the third quarter of \$972,962. There was a surplus in the second quarter of \$203,167 and in the first quarter of \$1,197,283. Net income for the first nine months of the year was \$5,900,919, after all charges, equivalent after preferred dividends to \$1.48 a share earned on common stock. Total income for the nine months was \$24,445,774. Comparative income accounts for the first three quarters of the year follow:

	Third Quarter	Second Quarter	First Quarter
Total income.....	\$6,495,731	\$7,400,894	\$10,549,149
Int. and other charges....	3,466,107	3,189,173	3,079,598
Balance .....	\$3,029,624	\$4,211,721	\$7,469,551
Reserves deprec. depletion etc. ....	\$2,927,457	\$2,933,444	\$2,949,676
Net income.....	\$102,167	\$1,278,277	\$4,519,875
Preferred dividends.....	\$1,075,129	\$1,075,110	\$1,075,021
Common dividends.....			\$2,247,571
Deficit .....	\$972,962	*\$203,167	*\$1,197,283

\*Surplus.

#### President Grace's Statement

President Eugene G. Grace, commenting on the earnings' statement, pointed out that accounts covering reserves for depreciation and depletion are "not juggled" in order to make a good showing. The reserves for the three periods were nearly identical. Mr. Grace also called attention to the current assets. His statement follows:

The earnings covering fixed charges but not preferred dividends reflected low operations, represented by a steel output at 42 per cent of capacity, compared with the previous quarter of 43 per cent. The year to date (nine months) showed earnings on the common stock of \$1.48 a share or at the rate of \$1.97 for the year on an average operation for the nine months of 54 per cent.

A very encouraging feature of the situation was the monthly increase throughout the quarter, represented by monthly output of July, 31 per cent, August, 45 per cent, September, 52 per cent, with present operations running at a rate of 65 per cent, or more than double the low rate of July.

Notwithstanding the increased rate of production, the volume of orders on hand at the end of the quarter amounted to \$49,971,161, as compared with \$40,196,928 at the end of the second quarter.

Mr. Grace said that the company has \$49,686,000 of cash and Government securities in the treasury, that current assets exceed current liabilities by \$134,000,000 (a ratio of assets to liabilities of 5.24) and that full provision has been made for the authorized construction program of approximately \$31,000,000.

#### Youngstown Steel & Tube Co.

More favorable than most third-quarter reports is that of the Youngstown Sheet & Tube Co. and subsidiaries, which show net profits of \$472,899, after depreciation, interest and Federal taxes. This com-

pares with \$1,857,873 in the preceding quarter and \$3,341,346 in the third quarter of 1923. Earnings in the third quarter after preferred dividends were equivalent to 22c. a share earned on 987,606 shares of no par common stock outstanding. Net profit for the first nine months of the current year totalled \$6,091,400 after all charges, compared with \$14,689,899 in the corresponding period of 1923.

Officials point out that July was the poorest from an operating standpoint in a number of years, with production averaging only 25 per cent. August showed improvement, while operations increased to such an extent in September that the company was able to show a profit.

A decline in the company's funded debt is indicated by the interest charge for the third quarter of \$1,088,845, compared with \$1,119,837 in the previous quarter. The company has reduced its funded debt about \$2,000,000 since the 1923 annual statement, when it showed \$71,246,000. Surplus account at the end of the last quarter showed \$23,715,728.

#### Reports of Other Companies

The Virginia Iron, Coal & Coke Co., whose net operating revenue for the third quarter was \$631,647, reported total net income of \$70,989, from which interest, taxes, etc., were deducted to the amount of \$104,962, leaving a net loss of \$27,973. This compares with a loss of \$51,199 in the second quarter and net profit for the first period of \$5,792.

Gross receipts of the Colorado Fuel & Iron Co. totaled \$8,932,484, against \$7,769,531 a year ago; operating expenses of \$8,280,210, compared with last year's \$7,096,421; net earnings from operations of \$652,273, compared with \$673,110, and total income of \$767,407, against last year's \$778,475.

Income after deducting fixed charges amounted to \$56,163 for the quarter, against \$66,026 a year ago, and after allowing for depreciation there was a deficit of \$297,789, against a deficit for the corresponding period last year of \$316,644.

In the three months ended Sept. 30 last the profits of the Chicago Pneumatic Tool Co., after depreciation charges and Federal taxes, were \$157,300, and net profits \$132,495, or \$1.20 a share, contrasted with \$218,140, or \$1.91 a share for the like quarter, 1923. Net profits for the nine months ended Sept. 30 aggregated \$446,641, or \$4.06 a share, as against \$644,857, or \$5.66 a share for the first nine months of 1923.

### Further Plans of Youngstown Sheet & Tube in Chicago District

Plans now being made by the Youngstown Sheet & Tube Co. for added capacity in the Chicago district embrace a wire rod mill to produce 10,000 tons a month, a wire plant equipped with wire drawing and nail machines, and a sheet and tin plate mill. The finishing mills will necessitate the building of three open-hearth furnaces and improvement of the blooming mill at Indiana Harbor, Ind., to take care of the increased steel output. The construction of a new blast furnace, now under way at Indiana Harbor, is the first step in the expansion program.

In determining the tonnage rates to be paid affected workers at the bimonthly settlements between the Western Sheet and Tin Plate Manufacturers Association and the Amalgamated Association of Iron, Steel and Tin Workers, the examining committee will continue to use the mill invoice price. Tonnage rates are based upon the average selling price over a 60-day period of Nos. 26, 27 and 28 gage black sheets, and rise or fall in proportion to the changes in the selling price. Sheet and tin mill workers employed by subscribing interests are affected by these settlements. Whereas heretofore there has been little spread between prices as submitted by the various contributing mills, it is expected there will be a wider range with the elimination of the Pittsburgh price basing practice.

## FABRICATED STEEL BUSINESS

### New Inquiries in Fair Volume—Some Business Reported Held Back Pending Result of the Election

While awards on structural projects amounted to only about 17,000 tons in the past week, new work totaling more than 37,000 tons portends a not inconsiderable post-election activity. In addition to the work that has actually come into the market, fabricators foresee the issuance of a fair volume of inquiries that are reported to be held back as a result of hesitancy caused by the impending election.

L. S. Plaut & Co., store building, Newark, N. J., 3500 tons, general contract to Starrett Brothers.  
Baltimore & Ohio Railroad, two bridges in Ohio, 200 tons, to American Bridge Co.

Central Medical Building, Philadelphia, 600 tons to Belmont Iron Works.

Pennsylvania Railroad, highway bridge, Monmouth Junction, N. J., 200 tons to Bethlehem Steel Co.

Childs Restaurant, building, Cleveland, 600 tons, to McClintic-Marshall Co.

Theater and store building, Atlantic City, N. J., 300 tons, to New York Shipbuilding Co.

Staten Island Edison Co., Staten Island, N. Y., power house extension, 600 tons, to Phoenix Iron Works.

Loft building, Broadway and Twenty-first Street, New York, 2000 tons, to Taylor-Fichter Co.

William J. Taylor, garage, Seventy-sixth Street, New York, 300 tons, to McClintic-Marshall Co.

Office building, Hartford, Conn., 300 tons, to Levering & Garrigues Co.

Atlantic Coast Line Railroad, bridge, 200 tons, to unnamed fabricator.

School, Springfield, Mass., 200 tons, to unnamed fabricator.

Patterson-Leitch Co., Cleveland, warehouse, 175 tons, to Jones & Laughlin Steel Corporation.

Novelty Lamp & Shade Co., Cleveland, factory building, 200 tons, to T. H. Brooks & Co.

Continental Fibre Co., plant at Newark, Del., 600 tons, to Austin Co.

Highway bridge near Dayton, Ohio, 150 tons, to Brookville Bridge Co.

Gas holder, Lawrenceville, Ind., 150 tons, to Chicago Bridge & Iron Co.

Central Tube Co., Economy, Pa., plant extension, 1500 tons, to Jones & Laughlin Steel Corporation.

Crane Co., foundry addition, Chicago, 3000 tons, to Massillon Bridge Co.

Chicago, Burlington & Quincy, Western Avenue bridge, Chicago, 535 tons, to American Bridge Co.

Indian Refining Co., Lawrenceville, Ill., 2000 cu. ft. gas holder, 250 tons, to Chicago Bridge & Iron Works.

By-Products Coke Corporation, South Chicago, sintering plant at Federal furnace works, 245 tons, to Variety Iron & Steel Works, Cleveland.

Chicago, Rock Island & Pacific, four 55-ft. deck plate girder spans, Spring Valley, Ill., 188 tons, to McClintic-Marshall Co.

Joslyn Mfg. & Supply Co., crane runway and mill building, Chicago, 156 tons, to Vanderkloof Steel Works.

Illinois Northern Utilities Co., power plant, Dixon, Ill., 122 tons, to Lakeside Bridge & Steel Co.

Illinois Central, second section catenary bridge construction, Chicago, 115 tons, to Continental Bridge Co.

Kleckhefer Container Co., Milwaukee, addition to plant and warehouse, 350 tons, to Milwaukee Bridge Co.

Wisconsin Highway Commission, bridge at Barton, 100 tons, to Lakeside Bridge & Steel Co.

### Structural Projects Pending

Inquiries for fabricated steel work include the following:

Apartment building, 127-129 West Twenty-ninth Street, New York, 700 tons.

S. S. Kresge Co., buildings at Elizabeth and New Brunswick, N. J., 200 tons each.

Theater and office building, Summit, N. J., 100 tons.

Schools Nos. 68 and 72, New York, 500 tons each.

International Harvester Co., service station, Long Island City, 200 tons.

L. Bamberger & Co., service station, Newark, N. J., 1500 tons.

Union Electric Light & Power Co., third section of power house, East St. Louis, Mo., 2300 tons.

University of Pittsburgh, stadium, 1000 tons.

Pennsylvania Railroad, bridge, Fort Wayne, Ind., 300 tons.

Baltimore & Ohio Railroad, bridge in Maryland, 200 tons.

Perkins Co., Holyoke, Mass., mill building, 500 tons.  
New York Central Railroad, bridge repairs in Indiana, 300 tons.

Boston Rapid Transit Co., Dorchester tunnel, 250 tons.  
Theater and stores, Egleston Square, Roxbury, Boston, 226 tons.

Storage warehouse, Cambridge, Mass., 200 tons.

Manufacturing plant, Willimansett, Mass., 300 tons.

Columbus Electric & Power Co., Columbus, Ga., transmission towers, Stone & Webster, Boston, 500 tons.

High school, Lynn, Mass., 485 tons.

Bourne-Fuller Co., Cleveland, factory building, 500 tons.

Ohio Bell Telephone Co., building, Cleveland, estimated 7500 tons; plans not completed.

McKinney Steel Co., Cleveland, buildings in connection with River furnaces, 180 tons.

Warren G. Harding school, Warren, Ohio, 100 tons.

Big Four Railroad, two girder spans, 150 tons, McClintic-Marshall Co. low bidder; turntable, 100 tons, American Bridge Co. low bidder.

Mississippi River Commission, 17 river barges, 2100 tons, bids asked.

South Water Street Removal Co., new market center for produce commission merchants, Chicago, 15,000 tons.

Shea Theater, Buffalo, 1000 tons, bids taken.

Three school buildings in Buffalo, 300 tons.

## RAILROAD EQUIPMENT BUYING

### The Southern Railway Orders 1400 Freight Cars—Wheeling Buys 1000 Cars

The Southern has placed 1000 box cars for the Georgia Southern & Florida and 60 box cars for the Mobile & Ohio with the American Car & Foundry Co., 200 drop bottom gondolas for the Mobile & Ohio with the General American Car Co. and 150 hopper cars for the same subsidiary with the Kilby Car & Foundry Co. The Wheeling & Lake Erie has ordered 1000 box cars from the Standard Steel Car Co. The Rapid Transit Subway Construction Co., New York, has placed 150 motor car bodies with the American Car & Foundry Co. The Northern Pacific is inquiring for 800 gondola cars, 10 coaches, five baggage and five combination baggage and mail cars. The Norfolk & Western is inquiring for 3000 all-steel gondola cars. The Long Island has placed 40 passenger cars with the American Car & Foundry Co. and is in the market for 15 caboose cars. The Great Northern has placed 500 stock car bodies with the Siems-Stempel Co.

The Hutchins Car Roofing Co., Detroit, has ordered 900 tons of car ends from the General American Car Co. The Wabash is inquiring for 50 locomotives. The Missouri Pacific is expected to buy 30 locomotives in addition to the 50 ordered in September. The Mobile & Ohio has placed four Mikado type locomotives with the Lima Locomotive Co. and one Pacific type with the Baldwin Locomotive works.

The Great Northern Railway Co. is inquiring for an all-steel air-operated spreader.

The Missouri Pacific has awarded the repairs on 300 freight cars to the American Car & Foundry Co.

The Standard Oil Co. of Brazil is inquiring for 10 50-ton capacity tank cars.

The South Indian Railway Co. is inquiring for 20 tank cars, 30 tons capacity.

The J. H. France Refractories Co., Snow Shoe, Pa., chartered recently with capital stock of \$300,000, has taken over the plant owned by the Snow Shoe Fire Brick Co. Operations will begin at first in the manufacture of fire brick for furnace and steel mill use. Its plant is undergoing extensive repairs and will soon be in production. J. H. France, formerly the owner of the Snow Shoe Fire Brick Co., is president.

The Special Stamping & Mfg. Corporation, 205 Lafayette Street, New York, has been incorporated with capital stock of \$50,000 and will manufacture metal stampings and other mechanical equipment. E. McFarlane and W. Silbre are the principals. The company has temporary headquarters and will go into operation on a limited scale.



# NON-FERROUS METALS

## The Week's Prices

Cents per Pound for Early Delivery

	Copper, New York		Straits Tin (Spot)		Lead		Zinc	
	Lake	Electro-lytic*	New York	New York	St. Louis	New York	St. Louis	New York
Oct. 22.....	13.25	13.00	51.62½	8.50	8.25	6.75	6.40	
23.....	13.25	13.00	51.75	8.60	8.30	6.75	6.40	
24.....	13.37½	13.12½	52.00	8.75	8.37½	6.77½	6.42½	
25.....	13.37½	13.12½	.....	8.87½	8.50	6.82½	6.47½	
27.....	13.50	13.25	52.25	9.00	8.75	6.85	6.50	
28.....	13.50	13.25	52.00	9.00	8.75	6.87½	6.52½	

\*Refinery quotation; delivered price ¼c. higher.

## New York

NEW YORK, Oct. 28.

The markets are all strong with prices considerably higher. Copper has advanced ¼c. in the last week with buying fairly good. Tin is higher in a speculative market. Lead is scarce and prices are exceedingly higher. So far buying of zinc has strengthened the market.

**Copper.**—Buying by one of the largest consumers of copper in the country yesterday and about 10 days ago conferred strength upon the market in each day, but particularly the former. In the first case, the market had a tendency to weaken. Late yesterday about 1,000,000 lb. of electrolytic copper was sold at 13.62½c., but considerable metal is still available at 13.50c. to fix the market quotations at 13.50c. to 13.62½c. Producers are pretty well sold up and consumers are fairly well covered, but it is believed that if the election is favorable, a large potential demand which still exists will become effective. Lake copper is quoted at 13.50c.

**Tin.**—So far as quotations are concerned, particularly in London, the market is bullish, but in actual sales the market is only moderately active. The day on which the most business was done during the last week was Thursday, Oct. 23, when 300 to 400 tons changed hands, all London offerings being accepted. On Friday, Oct. 24, about 200 tons changed hands, but on other days trading was of very small proportions. Speculators in London and on this side have been lifting prices partly in anticipation of a favorable outcome of the election, believing that prices will still go higher next week and that consumers who have stayed out of the market already too long will have to make purchases. The market today was moderately active with 200 to 300 tons reported sold, with spot Straits quoted at the close at 62c., New York. Prices in London today were about £3 per ton higher than a week ago.

**Lead.**—It is almost impossible to secure lead for any delivery. There are practically no sellers and prices are advancing very rapidly. The leading interest has advanced its contract price three times within the last week, from 8.25c. to 8.40c. on Oct. 23, 8.40c. to 8.50c. on Oct. 25 and again to 8.65c. yesterday. Quotations in the outside market have each day been higher than the leading interest's price, and business has been done at the prices indicated above. Yesterday lead sold as high as 8.95c., St. Louis, and the outside market is quotable anywhere from 8.75c. to 8.95c., St. Louis, and 8c., New York. Consumers are believed to be pretty well covered, but prices may still go higher because both dealers and consumers are bidding the market up.

**Zinc.**—The strength of this metal is due largely to buying for foreign consumption, although domestic demand has been fairly good. One seller stated that prices for export are better than those obtained for domestic consumption. Prime Western today is quoted at 6.52½c., St. Louis, or 6.87½c., New York.

**Nickel.**—Quotations for shot and ingot nickel are unchanged at 28c. to 30c. per lb., with electrolytic nickel held at 33c.

**Antimony.**—Because of the probability of a cessation of hostilities in China, the market is easier and Chinese metal is quoted at 11.75c., New York, duty paid.

**Aluminum.**—Virgin metal, 98 to 99 per cent pure, is quoted at 27c. to 28c., duty paid, delivered.

**Old Metals.**—Prices continue to advance and business is active. Dealers' selling prices are as follows in cents per lb.:

Copper, heavy and crucible .....	13.00
Copper, heavy and wire .....	12.00
Copper, light and bottoms .....	10.75
Heavy machine composition .....	10.00
Brass, heavy .....	8.25
Brass, light .....	6.50
No. 1 red brass or composition turnings ..	8.75
No. 1 yellow rod brass turnings .....	8.25
Lead, heavy .....	7.50
Lead, tea .....	6.25
Zinc .....	4.25
Cast aluminum .....	17.50
Sheet aluminum .....	17.50

## Chicago

OCT. 28.—Copper, lead and zinc have advanced, while tin has declined. The advance in lead was very sharp, responding to a greater extent than the other metals to increased demand. Trading has been most active among middlemen, although consumer buying has been considerable. Most of the old metal grades have advanced. We quote in carload lots: Lake copper, 13.75c.; tin, 51.50c.; lead, 9.15c.; spelter, 6.55c.; antimony, 13.50c., in less than carload lots. On old metals we quote copper wire, crucible shapes and copper clips, 10.75c.; copper bottoms, 9.25c.; red brass, 8.25c.; yellow brass, 7c.; lead pipe, 7.75c.; zinc, 4c.; pewter, No. 1, 25c.; tin foil, 31c.; block tin, 42c.; all buying prices for less than carload lots.

## Fabricating Business Declines at Youngstown

YOUNGSTOWN, Oct. 28.—With fabricating interests in this territory, new business has shown a tendency to fall away rather sharply the past two weeks, due in large measure to the disquieting effects of the political situation.

Within three weeks, the Truscon Steel Co. has curtailed 25 per cent, and operations now range from 70 to 75 per cent in the various departments. A considerable part of the decline in buying affecting the Truscon company is due to a seasonal condition in the construction industry.

The General Fireproofing Co. is holding production around 80 per cent, with demand fair to good for metal filing cabinets and fireproofing building materials.

The Youngstown Boiler & Tank Co. is receiving some business from interests in the Northern oil fields, adding additional storage capacity, but its average production has shown appreciable decline the past month.

The Kalman Steel Co. is operating its Youngstown plant at 35 to 40 per cent, with only a limited demand for reinforcing bars.

Manufacturing mechanical rubber goods to a large extent, the Republic Rubber Corporation is running at 80 per cent.

## Steel and Industrial Stocks

The range of prices on active steel and industrial stocks from Monday of last week to Monday of this week was as follows:

	Low	High		Low	High
Allis-Chalmers ..	56½	59	Int. Har. pf. ....	111½	111½
Allis-Chal. pf. ...	98½	99	Jones & L'lin pf. 110	110½	110½
Am. B. S. & Fdy. 81½	82		Lima Loco. ....	59½	60½
Am. B.S. & F. pf. 106	106		Nat.-Acme .....	4½	5
Am. Can. ....	128½	132½	Nat. En. & Sm. . .	21	22½
Am. Can pf. ....	115½	116½	Nat. En. & S. pf. 69	69½	69½
Am. Car & Fdy. 163½	165		N. Y. Air Brake 41½	42½	42½
Am. C. & F. pf. 120	120		Otis Steel .....	7	7½
Am. Locomotive. 77½	79½		Otis Steel pf. ....	44	44½
Am. Loco. pf. ....	119½	119½	Pressed Steel Car 44	44½	44½
Am. Radiator ..	116½	117½	Pressed Steel pf. 70½	71½	71½
Am. Steel Fdries. 36½	37½		Replogie Steel ..	10½	11½
Bald. Loco. ....	116½	119½	Republic .....	42	42½
Beth. Steel .....	37½	43½	Republic pf. ....	83	83
Beth. Stl. 7½ pf. 91	93½		Sloss-Sheffield ..	67½	69
Beth. Stl. 8½ pf. 104½	107½		Sloss-Shef. pf. ...	83½	90
Br. Em. Stl. 1 pf. 31	31		Transue-Wms. ...	28½	28½
Chic. Pneu. Tool 94	95		Un. Alloy Steel. .	20	21
Colo. Fuel .....	28½	42½	U. S. Pipe. ....	106½	117½
Crucible Steel ..	53½	55½	U. S. Pipe pf. ...	95	104½
Crucible Stl. pf. .	88½	88½	U. S. Steel. ....	105½	108½
Gen. Electric ..	244½	244½	U. S. Steel pf. ...	123	123½
Gt. No. Ore Cert. 29	30		Vanadium Steel. .	22½	23½
Gulf States Steel 65	70½		Va. L. C. & Coke 37	37	37
Inland Steel ...	38½	40½	Whouse Air Br. 93½	94	94
Int. Har. ....	92½	95	Ygtown S. & T. 63	63	63

# Prices of Finished Iron and Steel Products

(Carload Lots)

## Tank Plates

F.o.b. Pittsburgh mills, base, per lb.....1.80c. to 1.90c.  
F.o.b. Chicago, base, per lb.....2.00c. to 2.10c.

## Structural Shapes

F.o.b. Pittsburgh mills, base, per lb.....2.00c.  
F.o.b. Chicago, base, per lb.....1.90c. to 2.00c.

## Iron and Steel Bars

Soft steel bars f.o.b. P'gh mills, base, per lb.....2.00c.  
Soft steel bars f.o.b. Chicago, base, per lb.....2.00c. to 2.10c.  
Reinforcing steel bars f.o.b. P'gh mills, base, per lb.....2.00c.  
Rail steel bars f.o.b. Chicago district mills, base, per lb.....2.00c.  
Common iron bars delivered New York, base, per lb.....2.34c.  
Common iron bars f.o.b. Chicago, base, per lb.....2.10c.  
Refined iron bars f.o.b. P'gh mills, base, per lb.....2.90c. to 3.00c.  
Common iron bars delivered Philadelphia, base, per lb.....2.32c.

## Hot-Rolled Flats

(Pittsburgh)

Hoops, base, per lb.....2.50c. to 2.60c.  
Bands, base, per lb.....2.40c. to 2.50c.  
Strips, base, per lb.....2.25c. to 2.40c.

## Cold-Finished Steel

Bars and shafting, f.o.b. P'gh mills, base, per lb.....2.70c.  
Bars and shafting f.o.b. Chicago mills, base, per lb.....2.70c.  
Screw stock, Worcester mills, base, per lb.....2.90c.  
Shafting, ground, f.o.b. mill, base, per lb.....3.10c.  
Screw stock, base, per lb., Cleveland.....2.75c.  
Strips, f.o.b. P'gh mills, base, per lb.....4.00c.  
Strips, f.o.b. Cleveland mills, base, per lb.....4.00c.  
Strips, f.o.b. Chicago mills, base, per lb.....4.30c.  
Strips, f.o.b. Worcester mills, base, per lb.....4.15c.

## Wire Products

(To jobbers in car lots f.o.b. Pittsburgh and Cleveland)

Nails, base, per keg.....\$2.75  
Bright plain wire, base, No. 9 gage, per 100 lb.....2.50  
Annealed fence wire, base, per 100 lb.....2.65  
Galvanized wire No. 9, base, per 100 lb.....3.10  
Galvanized barbed, base, per 100 lb.....3.45  
Galvanized staples, base, per keg.....3.45  
Painted barbed wire, base, per 100 lb.....3.20  
Polished staples, base, per keg.....3.20  
Cement coated nails, base, per count keg.....\$2.10 to 2.15  
Woven wire fence, base, per net ton to retailers.....\$65.00

Chicago district mill prices are \$2 per ton above the foregoing and Chicago delivered prices are \$3 per ton above the prices f.o.b. Cleveland and Pittsburgh. Birmingham mill prices \$3 a ton higher; Worcester, Mass., mills \$3 a ton higher on products of that plant, and Duluth, Minn., mills \$4 a ton higher.

## Sheets

Blue Annealed  
(base) per lb.

Nos. 9 and 10, f.o.b. Pittsburgh dist. mills.....2.60c. to 2.70c.  
\*Nos. 9 and 10 (base) per lb., f.o.b. Chicago dist. mills.....2.80c.

Box Annealed, One Pass Cold Rolled

No. 28 (base) per lb., f.o.b. Pittsburgh dist. mills. 3.40c. to 3.50c.  
\*No. 28 (base) per lb., f.o.b. Chicago dist. mills.....3.60c.

Galvanized

No. 28 (base) per lb., f.o.b. Pittsburgh dist. mills. 4.50c. to 4.60c.  
\*No. 28 (base) per lb., f.o.b. Chicago dist. mills.....4.70c.

Tin-Mill Black Plate

No. 28 (base) per lb., f.o.b. Pittsburgh dist. mills. 3.40c. to 3.50c.  
\*No. 28 (base) per lb., f.o.b. Chicago dist. mills.....3.60c.

Automobile Body Sheets

No. 22 (base) per lb., f.o.b. mill.....4.60c.

Long Ternes

No. 28 (base) 8-lb. coating, per lb., f.o.b. mill.....4.90c.

\*Add 5c. per 100 lb. for delivery in Chicago.

## Tin Plate

Standard cokes, per base box f.o.b. Pittsburgh district Mills.....\$5.50  
Standard cokes, per base box f.o.b. Chicago district mills 5.60  
Standard cokes, per base box f.o.b. Elwood, Ind.....5.60

## Terne Plate

(F.o.b. Pittsburgh, district mills)  
(Per Package, 20 x 28 in.)

8-lb. coating, 100 lb. base.....\$11.00	20-lb. coating I. C.....\$14.90
8-lb. coating I. C.....11.30	25-lb. coating I. C.....16.20
12-lb. coating I. C.....12.70	30-lb. coating I. C.....17.35
15-lb. coating I. C.....13.95	35-lb. coating I. C.....18.35
	40-lb. coating I. C.....19.35

## Rivets

Large, f.o.b. P'gh and Cleveland mill, base, per 100 lb.....\$2.50 to \$2.60  
Large, f.o.b. Chicago mills, base, per 100 lb.....2.75  
Small, f.o.b. P'gh and Cleveland mills 70, 10 and 5 per cent off list  
Small, f.o.b. Chicago mills.....70 and 10 off list

## Rails and Track Equipment

(F.o.b. mill)

Rails, standard, per gross ton.....\$43.00  
Rails, light, billet, base, per lb.....1.80c. to 1.90c.  
Rails, light rail steel, base, per lb.....1.65c. to 1.75c.  
Spikes, 1/2 in. and larger, base, per 100 lb.....\$2.70 to \$3.00  
Spikes, 1/2 in. and smaller, base, per 100 lb.....3.00  
Spikes, boat and barge, base, per 100 lb.....3.75 to 4.00  
Track bolts, all sizes, base, per 100 lb.....4.25 to 4.50  
Track bolts, heat treated, base, per 100 lb.....2.40 to 2.50  
Tie plates, per 100 lb.....2.75  
Angle bars, base, per 100 lb.....2.75

## Welded Pipe

(F.o.b. Pittsburgh district mills)

Butt Weld

Inches	Steel Black	Galv.	Inches	Iron Black	Galv.
1/4	45	19 1/2	1/4 to 3/8	+11	+39
1/4 to 3/8	51	25 1/2	1/2	22	2
1/2	56	42 1/2	3/4	28	11
3/4	60	48 1/2	1 to 1 1/2	30	13
1 to 3	62	50 1/2			

Lap Weld

2	55	43 1/2	2	23	7
2 1/2 to 6	59	47 1/2	2 1/2	26	11
7 and 8	56	43 1/2	3 to 6	28	13
9 and 10	54	41 1/2	7 to 12	26	11
11 and 12	53	40 1/2			

Butt Weld, extra strong, plain ends

1/4	41	24 1/2	2 to 3	61	50 1/2
1/4 to 3/8	47	30 1/2	1/4 to 3/8	+11	+54
1/2	53	42 1/2	1/2	21	7
3/4	58	47 1/2	3/4	28	12
1 to 1 1/2	60	49 1/2	1 to 1 1/2	30	14

Lap Weld, extra strong, plain ends

2	53	42	2	23	9
2 1/2 to 4	57	46 1/2	2 1/2 to 4	29	15
4 1/2 to 6	56	45 1/2	4 1/2 to 6	28	14
7 to 8	52	39 1/2	7 to 8	21	7
9 and 10	45	32 1/2	9 to 12	16	2
11 and 12	44	31 1/2			

To the large jobbing trade the above discounts are increased (on black) by one point, with supplementary discount of 5 per cent and (on galvanized) by 1 1/2 points, with supplementary discount of 5 per cent.

NOTE—The above discounts on steel pipe also apply at Lorain and Youngstown, Ohio, and Wheeling, W. Va. Chicago district mills have a base 2 points less. Chicago delivered base 2 1/2 points less.

## Boiler Tubes

(F.o.b. Pittsburgh)

Lap Welded Steel

2 to 2 1/4 in.	27	1 1/2 in.	+18
2 1/4 to 2 3/4 in.	37	1 3/4 to 1 7/8 in.	+8
3 in.	40	2 to 2 1/4 in.	—2
3 1/4 to 3 3/4 in.	42 1/2	2 1/4 to 3 in.	—7
4 to 13 in.	46	3 1/4 to 4 1/2 in.	—9

Beyond the above discounts, 4 to 5 fives extra are given on lap welded steel tubes and 3 tens on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes  
Cold Drawn

1 in.	55-58	3 and 3 1/4 in.	36-39
1 1/4 and 1 1/2 in.	47-50	3 1/2 and 3 3/4 in.	37-40
1 3/4 in.	31-34	4 in.	41-44
2 and 2 1/4 in.	22-25	4 1/2 in. and 5 in.	33-37
2 and 2 1/2 in.	32-35		

Hot Rolled

3 and 3 1/4 in.	38-41	4-in.	43-46
3 1/2 in. and 3 3/4 in.	39-42		

Less carloads, 4 points less. Add \$8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Carbon under 0.30 base.....87 per cent off list  
Carbon 0.30 to 0.40, base.....85 per cent off list

Plus usual differentials and extras for cutting. Warehouse discounts range higher.

Seamless Locomotive and Superheater Tubes

	Cents per Ft.		Cents per Ft.
2-in. O.D. 12 gage....	15	2 1/4-in. O.D. 10 gage....	20
2-in. O.D. 11 gage....	16	3-in. O.D. 7 gage....	35
2-in. O.D. 10 gage....	17	1 1/2-in. O.D. 9 gage....	15
2 1/4-in. O.D. 12 gage....	17	5 1/2-in. O.D. 9 gage....	55
2 1/4-in. O.D. 11 gage....	18	5 1/2-in. O.D. 9 gage....	57



# Prices of Raw Materials, Semi-Finished and Finished Products

## Ores

### Lake Superior Ores, Delivered Lower Lake Ports

Old range Bessemer, 55 per cent iron.....	\$5.65
Old range non-Bessemer, 51½ per cent iron.....	4.90
Mesabi Bessemer, 55 per cent iron.....	5.40
Mesabi non-Bessemer, 51½ per cent iron.....	4.75

### Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore

Iron ore, low phos., copper free, 55 to 58 per cent iron in dry Spanish or Algerian.....	9.00c. to 9.50c.
Iron ore, Swedish, average 66 per cent iron.....	9.50c.
Manganese ore, washed, 51 per cent manganese, from the Caucasus, nominal.....	42c.
Manganese ore, ordinary, 48 per cent manganese from the Caucasus.....	40c.
Manganese ore, Brazilian or Indian, nominal.....	42c.
Tungsten ore, high grade, per unit, in 60 per cent concentrates.....	\$8.00 to \$8.50
Chrome ore, basic, 48 per cent Cr <sub>2</sub> O <sub>3</sub> , crude, per ton, c.i.f., Atlantic seaboard.....	18.50 to 24.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS <sub>2</sub> , New York.....	80c.

## Ferroalloys

Ferromanganese, domestic, 80 per cent, furnace, or seaboard, per ton.....	\$90.00 to \$100.00
Ferromanganese, foreign, 80 per cent, f.o.b. Atlantic port, duty paid.....	92.50 to 100.00
Ferrosilicon, 50 per cent, delivered.....	70.00 to 75.00
Ferrosilicon, 75 per cent.....	140.00
Ferrotungsten, per lb. contained metal.....	87c. to 90c.
Ferrochromium, 4 to 6 per cent carbon, 60 to 70 per cent Cr. per lb. contained Cr. delivered.....	10.75c.
Ferrochromium, 6 to 7 per cent carbon, 60 to 70 per cent Cr., per lb.....	10.50c.
Ferrovandium, per lb. contained vanadium.....	\$3.50 to \$4.00
Ferrocobaltititanium, 15 to 18 per cent, per net ton.....	200.00

## Spiegeleisen, Bessemer Ferrosilicon and Silvery Iron

(Per gross ton furnace unless otherwise stated.)

Spiegeleisen, domestic, 19 to 21 per cent.....	\$30.00 to \$33.00
Spiegeleisen, domestic, 16 to 19 per cent.....	29.00 to 32.00
Ferrosilicon, Bessemer, 10 per cent, \$39.50; 11 per cent, \$42; 12 per cent, \$44.50; 14 to 16 per cent (electric furnace), \$36.00.	
Silvery iron, 5 per cent, \$27.00; 6 per cent, \$28.00; 7 per cent, \$29.00; 8 per cent, \$30.50; 9 per cent, \$32.50; 10 per cent, \$34.50; 11 per cent, \$37.00; 12 per cent, \$39.50.	

## Fluxes and Refractories

Fluorspar, 80 per cent and over calcium fluoride, not over 5 per cent silica, per net ton, f.o.b. Illinois and Kentucky mines .....			\$18.00
Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica, per net ton f.o.b. Illinois and Kentucky mines .....			19.50
Fluorspar, foreign, 85 per cent calcium fluoride, not over 5 per cent silica, c.i.f. Philadelphia, duty paid, per gross ton.....			19.75
Per 1000 f.o.b. works:			
Fire Clay:	High Duty	Moderate	Duty
Pennsylvania .....	\$40.00 to \$43.00	\$36.00 to	\$40.00
Maryland .....	45.00 to 47.00	40.00 to	42.00
Ohio .....	40.00 to 43.00	37.00 to	39.00
Kentucky .....	42.00 to 43.00	37.00 to	39.00
Illinois .....	—	37.00 to	42.00
Missouri .....	42.00 to 45.00	35.00 to	40.00
Ground fire clay, per net ton.....		6.00 to	7.00
Silica Brick:			
Pennsylvania .....			33.00
Chicago .....		43.00 to	44.00
Birmingham .....			50.00
Ground silica clay, per net ton.....		7.50 to	8.00
Magnesite Brick:			
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.).....			65.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.).....			40.00
Chrome Brick:			
Standard size, per net ton.....			45.00

## Bolts and Nuts

(Chicago and Pittsburgh)

Machine bolts, small rolled threads..	60 and 20 per cent off list
Machine bolts, all sizes, cut threads..	60 and 10 per cent off list
Carriage bolts, smaller and shorter, rolled threads, 60 and 10 per cent off list	
Carriage bolts, cut threads, all sizes.....	60 per cent off list
Hot-pressed nuts, blank or tapped, square.....	4.50c. off list
Hot-pressed nuts, blank or tapped, hexagons.....	5c. off list
C.p.c. and t. square or hex. nuts, blank or tapped.....	4.50c. off list
Eagle carriage bolts.....	65, 10 and 10 per cent off list
Flow bolts.....	50, 10 and 5 per cent off list
Semi-finished hex. nuts:	
1/4 in. and smaller, U. S. S.....	80, 10, 10 and 5 per cent off list
1/2 in. and larger, U. S. S.....	75, 10, 10 and 5 per cent off list
Small sizes, S. A. E.....	80, 10, 10, 10 and 5 per cent off list
S. A. E., 1/4 in. and larger.....	80, 10 and 5 per cent off list
Stove bolts in packages.....	80, 10 and 5 per cent off list
Stove bolts in bulk.....	80, 10, 5 and 2 1/2 per cent off list
Tire bolts.....	60 and 10 per cent off list
Bolt ends with hot pressed nuts.....	60 and 10 per cent off list
Bolt ends with cold pressed nuts.....	50 and 10 per cent off list
Washers.....	6.00c. to 6.25c. off list
Lock washers.....	80 per cent off list

Foregoing prices are quoted f.o.b. Cleveland by Cleveland manufacturers for Cleveland delivery.

## Semi-Finished Castellated and Slotted Nuts

(Chicago and Pittsburgh)

(To jobbers and consumers in large quantities)

Per 1000		Per 1000	
S. A. E.	U. S. S.	S. A. E.	U. S. S.
1/4-in. ....	\$4.25	1/4-in. ....	\$13.25
1/2-in. ....	4.90	1/2-in. ....	16.25
3/4-in. ....	5.90	3/4-in. ....	23.50
1-in. ....	7.50	1-in. ....	34.00
1 1/2-in. ....	9.75	1 1/2-in. ....	53.00

Larger sizes—Prices on application.

## Cap and Set Screws

(F.o.b. shipping point.)

Milled hex. cap screws.....	85 and 10 per cent off list
Milled standard set screws, case hardened.....	85 and 10 per cent off list
Milled headless set screws, cut thread.....	85 and 10 per cent off list
Upset hex. head cap screws, U. S. S. thread.....	85, 10, 10 and 5 per cent off list
Upset hex. head cap screws, S. A. E. thread.....	85, 10, 10 and 5 per cent off list
Milled studs.....	80 and 10 per cent off list

## Semi-Finished Steel, f.o.b. Pittsburgh or Youngstown, per gross ton

Rolling billets, 4-in. and over.....	\$25.50 to \$26.00
Forging billets, ordinary carbons.....	40.50 to 41.00
Sheet bars, Bessemer.....	37.00 to 37.50
Sheet bars, open hearth.....	37.00 to 37.50
Slabs.....	35.50 to 36.00
*Wire rods, common soft, base, No. 5 to 1/4-in.....	45.00 to 46.00
Wire rods, common soft, coarser than 1/4-in.....	\$2.50 over base
Wire rods, screw stock.....	\$5.00 per ton over base
Wire rods, carbon 0.20 to 0.40.....	3.00 per ton over base
Wire rods, carbon 0.41 to 0.55.....	5.00 per ton over base
Wire rods, carbon 0.56 to 0.75.....	7.50 per ton over base
Wire rods, carbon over 0.75.....	10.00 per ton over base
Wire rods, acid.....	15.00 per ton over base
Skelp, grooved, per lb.....	1.90c. to 2c.
Skelp, sheared, per lb.....	1.90c. to 2c.
Skelp, universal, per lb.....	1.90c. to 2c.

\*Chicago mill base is \$48.00.

## Alloy Steel

(F.o.b. Pittsburgh or mill)

S. A. E.	Series	Numbers	Bars 100lb.
2100*	(1/4% Nickel, 10 to 20 per cent Carbon)	...	\$3.00 to \$3.25
2300	(3/4% Nickel)	...	4.75
2500	(5% Nickel)	...	6.00 to 6.50
3100	(Nickel Chromium)	...	3.45 to 3.75
3200	(Nickel Chromium)	...	5.50 to 5.75
3300	(Nickel Chromium)	...	7.25 to 8.00
3400	(Nickel Chromium)	...	6.50 to 7.00
5100	(Chromium Steel)	...	3.50 to 3.75
5200*	(Chromium Steel)	...	7.50 to 8.00
6100	(Chromium Vanadium bars)	...	4.50
6100	(Chromium Vanadium spring steel)	...	4.25 to 4.50
9250	(Silicon Manganese spring steel)	...	3.50 to 3.75
Carbon Vanadium (0.45 to 0.55 Carbon, 0.15 Vanadium)	...		4c.
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chromium, 0.15 Vanadium)	...		4.25 to 4.50
Chromium Molybdenum bars (0.80—1.10 Chromium, 0.25—0.40 Molybdenum)	...		4.25 to 4.50
Chromium Molybdenum bars (0.50—0.70 Chromium, 0.15—0.25 Molybdenum)	...		3.75 to 4.25
Chromium Molybdenum spring steel (1—1.25 Chromium, 0.30—0.50 Molybdenum)	...		4.75 to 5.00

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold drawn bars is 1c. to 1 1/2c. per lb. higher. For billets 4 x 4 to 10 x 10-in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4-in. down to and including 3 1/4-in. squares, the price is \$5 a gross ton above the 4 x 4 billet price.

\*Not S.A.E. specifications, but numbered by manufacturers to conform to S.A.E. system.

## Freight Rates on Finished Steel from Leading Producing Centers to Various Consuming Points

### Rates Per One Hundred Pounds

#### From Pittsburgh to:

Akron, Ohio	\$0.19
Atlanta, Ga.	0.58
Baltimore	0.31
Beaumont, Tex.	0.705
Birmingham	0.58
Boston	0.385
Buffalo	0.265
Canton, Ohio	0.19
Caspar, Wyo.	1.15
Chattanooga, Tenn.	0.50
Chicago	0.34
Cincinnati	0.29
Cleveland	0.19
Coffeyville, Kan.	0.775
Columbus, Ohio	0.255
Dallas, Tex.	0.885
Denver	1.15
Detroit	0.29
Houston, Tex.	0.89

#### From Lorain to:

Akron, Ohio	\$0.09
Atlanta, Ga.	0.57
Baltimore	0.37
Beaumont, Tex.	0.655
Birmingham	0.57
Boston	0.43
Buffalo	0.255
Canton, Ohio	0.095
Caspar, Wyo.	1.125
Chattanooga, Tenn.	0.50
Chicago	0.29
Cincinnati	0.265
Cleveland	0.07
Coffeyville, Kan.	0.70
Columbus, Ohio	0.21
Dallas, Tex.	0.84
Denver	1.08
Detroit	0.215

#### From Cleveland to:

Akron	\$0.09
Atlanta	0.57
Baltimore	0.37
Boston	0.43
Buffalo, rail	0.23
Buffalo, water	0.22
Canton	0.095
Chattanooga	0.50
Chicago	0.30
Cincinnati	0.27
Columbus	0.215
Dayton	0.25
*Denver	1.15

Indianapolis	\$0.31
Jacksonville, Fla. (all rail)	0.70
Kansas City, Mo.	0.735
Memphis, Tenn.	0.56
New Orleans	0.67
New York	0.34
Omaha	0.735
Pacific Coast	1.15
Philadelphia	0.32
St. Louis	0.43
St. Paul	0.60
Shreveport, La.	0.79
Smackover, Ark.	0.82
Toledo, Ohio	0.27
Tulsa, Okla.	0.885
Wichita Falls, Tex.	0.89
Youngstown	0.11

Houston, Tex.	\$0.655
Indianapolis	0.275
Jacksonville, Fla., all rail	0.70
Kansas City, Mo.	0.615
Memphis, Tenn.	0.53
New Orleans	0.65
New York	0.40
Omaha	0.615
Pacific Coast	1.15
Philadelphia	0.38
St. Louis	0.355
St. Paul	0.56
Shreveport, La.	0.76
Smackover, Ark.	0.77
Toledo, Ohio	0.18
Tulsa, Okla.	0.84
Wichita Falls, Tex.	0.84

#### From Chicago to:

Aberdeen, S. D.	\$0.55
Akron, Ohio	0.30
Anderson, Ind.	0.24
Ashland, Ky.	0.32
Atlanta, Ga.	0.67
Baltimore	0.49
Beaumont, Tex.	0.53
Birmingham	0.31
Canton, Ohio	0.31
Caspar, Wyo.	0.835
Chasm, W. Va.	0.34
Chattanooga	0.49
Cincinnati	0.28
Cleveland	0.30
Columbus, Ohio	0.29
Dallas, Tex.	0.69
Dayton, Ohio	0.275
Denver	0.82
Des Moines, Iowa	0.295
Detroit	0.275
Duluth, Minn.	0.305
Evansville, Ind.	0.28
Flint, Mich.	0.29
Fort Wayne, Ind.	0.22
Galveston, Tex.	0.49
Hammond, Ind.	0.025
Houston, Tex.	0.49
Hutchinson, Kan.	0.585
Idaho, common points	1.00
Indianapolis	0.25
Jackson, Miss.	0.53
Kansas City	0.35
Kokomo, Ind.	0.215
Leavenworth, Kan.	0.35
Little Rock, Ark.	0.53
Los Angeles	1.00

Louisville, Ky.	\$0.41
Mansfield, Ohio	0.285
Memphis, Tenn.	0.42
Milwaukee	0.08
Minneapolis	0.275
Mobile, Ala.	0.57
Moline, Ill.	0.175
Montana, com. points	1.00
Morgantown, W. Va.	0.36
Muncie, Ind.	0.25
Muskogee, Okla.	0.60
New Orleans	0.57
Omaha, Neb.	0.35
Peoria, Ill.	0.155
Phoenix, Ariz.	1.00
Portland, Ore.	1.00
Portsmouth, Ohio	0.32
Pueblo, Colo.	0.82
Rawlins, Wyo.	0.90
St. Louis	0.35
St. Paul	0.275
San Francisco	1.00
Shreveport, La.	0.63
Sioux City, Iowa	0.35
Smackover, Ark.	0.60
South Bend, Ind.	0.185
Springfield, Ill.	0.175
Terre Haute, Ind.	0.24
Toledo, Ohio	0.265
Topeka, Kan.	0.435
Torrence, Cal.	1.00
Tulsa, Okla.	0.645
Utah, common points	0.95
Washington, com. pts.	1.00
Wichita, Kan.	0.585
Zanesville, Ohio	0.31

#### From Youngstown to:

Akron	\$0.095
Atlanta	0.58
Baltimore	0.355
Beaumont, Tex.	0.87
Pipe	0.67
Birmingham	0.58
Boston	0.405
Buffalo	0.25
Canton, Ohio	0.095
Caspar, Wyo.	1.15
Chattanooga, Tenn.	0.50
Chicago	0.32
Cincinnati	0.285
Cleveland	0.095
Coffeyville, Kan.	0.87
Pipe	0.74
Columbus, Ohio	0.25
Dallas, Tex.	1.02
Pipe	0.655
Denver	1.13
Pipe	1.14
Detroit	0.245
Houston, Tex.	0.87
Pipe	0.67

Indianapolis	\$0.30
Jacksonville, all rail	0.70
Kansas City	0.685
Pipe	0.655
Memphis	0.54
New Orleans	0.66
New York	0.375
Omaha	0.685
Pipe	0.655
Pacific Coast	1.15
Philadelphia	0.355
St. Louis	0.38
St. Paul	0.57
Shreveport, La.	0.79
Pipe	0.84
Smackover, Ark.	0.77
Pipe	0.82
Toledo	0.24
Tulsa, Okla.	0.87
Pipe	0.855
Wichita, Kan.	1.02
Pipe	0.86
Youngstown	0.11

\*Applies to minimum carload 40,000 lb. Rate is \$1.11 on minimum carload of 80,000 lb.

### Mill and Furnace Operations in the Mahoning Valley

YOUNGSTOWN, Oct. 28.—Twenty of the 45 blast furnaces in the Youngstown district, embracing the Mahoning and Shenango Valleys, are melting, representing about 50 per cent of the total iron capacity, as the larger stacks are in action.

The Republic Iron & Steel Co. has added two open-hearth furnaces to its active units, bringing the total of active independent open-hearth furnaces in the district to 34, of 52. The Republic company has also added four sheet mills to the eight which have been maintained in operation.

However, loss in active sheet mill capacity by the Trumbull Steel Co. offsets this gain, and sheet mill schedules for the Mahoning Valley, with 76 mills active, show a loss as compared with the week immediately preceding.

Active independent tin plate capacity is also smaller, with 23 of 38 units rolling. In this district, the Steel Corporation subsidiary is maintaining sheet mill capacity at 75 per cent and tin mill output at 80 per cent. One more plate mill is operating, however, giving the Valley two of four, in action; five of six skelp mills are rolling and 11 of 17 tube mills.

Rod, wire and conduit production is about 65 per cent.

The spotty state of the market is evidenced by the fluctuations from week to week of the several independent producers.

Including the Chicago district plants, the Youngstown Sheet & Tube Co. is running at 55 per cent, compared with a low production rate during mid-Summer of 30 per cent.

Some orders are being received in this district on a contingent basis, depending upon the result of the election.

"Pickling of Sheet Steel" was the subject of an illustrated talk given by Ewart S. Taylerson, engineer of tests, American Sheet & Tin Plate Co., Pittsburgh, at the bimonthly meeting of the Steel Works Section, Engineers Society of Western Pennsylvania at the William Penn Hotel, Pittsburgh, Tuesday evening, Oct. 28. Mr. Taylerson's remarks were brief and largely preliminary to the presentation of a series of stereopticon and motion pictures descriptive of the process of pickling. The technical side of steel pickling was not touched upon.



## PERSONAL

Francis G. Echols, vice-president and general manager Greenfield Tap & Die Corporation, Greenfield, Mass.; Jerome R. George, vice-president Morgan Construction Co., Worcester, Mass.; Charles L. Newcomb, manager Worthington Pump & Machinery Corporation, Holyoke, Mass.; and Theodore W. Little, vice-president Walworth Mfg. Co., Boston, have been made members of the executive committee of the Associated Industries of Massachusetts.

A. J. Glancy, president Glancy Malleable Corporation, Waukesha, Wis., and manager of the Samson Tractor Co., Janesville, Wis., has been appointed vice-president and assistant general manager in charge of production of the Oakland Motor Co., division of General Motors Corporation. Prior to joining the General Motors organization five years ago, Mr. Glancy was associated with the DuPont Engineering Co., which erected the Samson Tractor Co. works at Janesville, now occupied by a division of the Chevrolet and the Fisher Body subsidiaries.

Charles R. Speaker, formerly with the Bureau of Engineering, Navy Department, Washington, has been appointed representative in the District of Columbia for the Roller-Smith Co., maker of electrical instruments, 233 Broadway, New York. Mr. Speaker, a graduate in electrical engineering from Columbia University, will also handle the company's Government business in Maryland, Virginia, North Carolina and South Carolina. He served his apprenticeship with the Worthington Pump & Machinery Corporation at Harrison, N. J.

Arthur Levison, highway engineer in the United States Bureau of Public Roads, has been appointed chief engineer of the road building department of the Blaw-Knox Co. After obtaining his degree from New York University in 1910, Mr. Levison became in-

spector of road construction in the New York State Highway Department, and since that time he has been engaged continuously in construction work.

David J. Champion, president Champion Rivet Co., Cleveland, and trustee of the Catholic Charities Corporation, has given \$50,000 to endow a cottage in memory of his wife, Mrs. Rose A. Champion, at Parmadale, Ohio, the model village the corporation is building for orphans of the Cleveland diocese.

E. H. Lunde has joined the sales force of the Federal Machinery Sales Co., Chicago, and will specialize in sales and service work for the Geometric Tool Co., New Haven, Conn., in Chicago territory.

J. P. Groome has joined the sales force of Louis E. Emerman & Co., machinery dealer, 1765 Elston Avenue, Chicago. For seven and one-half years Mr. Groome was identified with the sales department of Manning, Maxwell & Moore, Inc., at Chicago, prior to which time he was associated with Hill, Clarke & Co., Chicago.

Director Heinrich Droste, editor of the *Deutsche Bergwerkszeitung* of Düsseldorf, Germany, is now in the United States.

Peter Eyermann, consulting engineer, Vienna, Austria, who several years ago was connected with the large steel works at Witkowitz, now in Czecho-Slovakia, is visiting steel plants in the United States. Mr. Eyermann had to do with the development of the blast furnace gas engine in this country and for several years maintained offices at Dubois, Pa., going abroad to take up his residence about 15 years ago.

Howard K. Moore, who has been general superintendent Steubenville works, Wheeling Steel Corporation, becomes supervisor of production at all plants Nov. 1, with headquarters at the company's general offices in Wheeling. E. H. Colleser, for several years superintendent of the coke works of the company at Follansbee, W. Va., and O. W. McCullough, who has been superintendent of rolling mills at Steubenville, will divide the work formerly handled by Mr. Moore.

### Wages of Puddlers and Iron Finishers Are Reduced

YOUNGSTOWN, Oct. 28.—Puddlers and bar iron finishers' tonnage rates decline for November-December, as a result of the bimonthly examination of sales sheets today between the Western Bar Iron Association and the Amalgamated Association of Iron, Steel and Tin Workers.

The examination disclosed an average selling price of \$2.10 per 100 lb. on bar iron shipped during the 60 days ending Oct. 20, a decline from \$2.15, the price revealed two months previously.

The new puddling rate is \$11.88 per ton, as compared with \$12.23, paid in September-October. Bar iron finishers are reduced 2½ per cent of the base.

Aside from contract tonnage, new steel business is largely confined to purchases required for early delivery. Makers look for a firming of prices, with improved business, for the first quarter of 1925.

### Trunk Line Association and Shippers Consider Freight Rates

PITTSBURGH, Oct. 28.—The Trunk Line Association, comprising railroads serving that territory east of Pittsburgh, Youngstown and Cleveland, which is working out a new system of rates to the East based upon the Disque principle and officials of the roads of the Central Freight Association who would be affected by a change in the rate structure, gave a hearing late last week to shippers in this and nearby districts.

While representatives of the steel companies saw many chances for rate revisions, there was pretty uniform opposition to any change in group rate classification, particularly on the part of Pittsburgh office district interests, which insisted that the plants had been

built up in this district on the basis of the group rate idea, which put all plants upon an even footing as to freight charges to the points outside the district.

At present the rate structure in the Central Freight Association territory is based upon the Disque principle, calling first class 100 per cent with other classes on a percentage of the first class rate. Eastern rates are simply those that have grown out of numerous changes during the war and in some respects are discriminatory. Correction of inequalities is what is being attempted in the Trunk Line Association revision.

### Scrap More Active at Detroit

DETROIT, Oct. 28.—The tone of the market on old material in this district took a decided change in the last few days and the offering of one of the largest producers of 4000 tons of miscellaneous material for November delivery on competitive basis developed prices showing an advance of about 50c. per ton on blast furnace materials. Melters are completing their contracts on pig iron and generally will have no stock at inventory period. The general feeling is that there will be a considerable buying movement in this material immediately following election.

The following prices are quoted on a gross ton basis f.o.b. producers' yards, excepting stove plate, No. 1 machinery cast and automobile cast, which are quoted on a net ton basis:

Heavy melting steel	\$14.50 to \$15.00
Shoveling steel	14.50 to 15.00
Borings	11.25 to 11.75
Short turnings	11.25 to 11.75
Long turnings	10.25 to 10.75
No. 1 machinery cast	15.00 to 16.00
Automobile cast	17.00 to 18.00
Hydraulic compressed	12.50 to 13.00
Stove plate	13.50 to 14.50
No. 1 bushing	11.25 to 11.75
Sheet clippings	8.75 to 9.25
Flashings	11.25 to 11.75

## OBITUARY

### Frederick H. Foote

Frederick Hodgeman Foote, one of the best known iron blast furnace managers of his time, died at Sarasota, Fla., on Oct. 20, aged 70 years. The funeral was held at the old Foote homestead at Port Henry, N. Y., on Friday, Oct. 24. Mr. Foote was born in Port Henry on Sept. 29, 1854. He received his education in the public schools of Port Henry and later at Sheffield Scientific School, Yale University, class of 1875. He began his business career in the First National Bank of Wyoming, Iowa, of which his father, Wallace T. Foote, was president for many years. He returned to Port Henry in 1879 and under the tutelage of his father at the Bay State furnaces there laid the foundation of his future successful blast furnace managership. After 1882 he was, successively, superintendent of blast furnaces at Everett and Pottstown, Pa., and Mayville, Wis. From 1890 to 1903 he was associated with the Illinois Steel Co. at Chicago, first as superintendent of furnaces at the South Chicago works and later as vice-president of the Illinois Steel Co. in charge of all furnaces. For a time he was a member of the blast furnace committee of the United States Steel Corporation.



F. H. FOOTE

In 1903 Mr. Foote purchased the blast furnace and iron ore properties at Spring Valley, Wis., which with the assistance of his two sons he operated until 1911, when he retired from active business. In the intervening years he had spent practically all of his winters in Sarasota, Fla., and his summers at Port Henry, N. Y. For a number of years he was president of the First National Bank of Wyoming, Iowa.

In 1877, Mr. Foote was married to Nettie A. Chamberlain, Wyoming, Iowa. Of their four children, Hilah E. Foote, Asheville, N. C., and William H. Foote, Sadorus, Ill., are living. Mrs. Foote died in 1917. Mr. Foote is survived by his sister, Mary E. Foote, Port Henry, N. Y., and his brothers, Charles S., Thomas H. and George C. Foote, vice-president and general manager Witherbee, Sherman & Co., Port Henry.

Despite a physical handicap, resulting from infantile paralysis, which would have defeated the average man, Mr. Foote entered into every activity of his business life and his beloved recreations of hunting, fishing and sailing with undaunted courage and perseverance.

LOUIS E. BOOTH, superintendent of the Rockdale plant, American Steel & Wire Co., at Rockdale, near Joliet, Ill., died at St. Joseph's Hospital, Joliet, on Oct. 12. Mr. Booth was born at Worcester, Mass., in 1868, and was graduated from the Worcester Polytechnic Institute in 1890. He entered the service of the American Steel & Wire Co. at Worcester in the same year and two years later was transferred to the Waukegan, Ill., works, where he spent a year. He then returned to Worcester as assistant superintendent and remained there until 1910, when he assumed charge at New Haven, Conn. In 1913 he was appointed superintendent of the Scott Street works at Joliet and in 1917 was transferred in the same capacity to the Rockdale plant.

CAPT. PATRICK F. BANNON, president and superintendent Farrel Foundry & Machine Co., Waterbury, Conn., since 1904, died of acute indigestion on Oct. 19,

at his home upon returning from church. He was born in 1855 and began earning his living at the age of twelve. He was for some time captain of the old Second Connecticut regiment.

AUSTIN H. PEASE, vice-president and assistant treasurer Wason Car Co., Springfield, Mass., died on Oct. 21, following a brief illness, in his fifty-eighth year. Mr. Pease was the son-in-law of the late Henry Pearson, formerly president of the old Wason Car Co. and vice-president when it was absorbed by the J. G. Brill Co. After Mr. Pearson's death about a year ago, Mr. Pease, who had been secretary, was made vice-president.

ROBERT M. DOWNEY, secretary and general manager Keystone Driller Co., Beaver Falls, Pa., died at the Beaver Valley Hospital, New Brighton, Pa., on Oct. 23, following a surgical operation. He was born near Harmony, Pa., 71 years ago and was graduated from Geneva College in 1881. He later was appointed a member of the board of directors of that institution. In 1882 he invented a portable drilling machine, and it was to manufacture this machine that the Keystone Driller Co. was organized. He was the organizer of the Fallston Clay Products Co., New Brighton, Pa., and was financially interested in the Pittsburgh Wire Co., Downieville, Pa.

FRANK BARR KNIGHT, engineer and manager of the Chicago branch of the Lidgerwood Mfg. Co., died suddenly of heart failure on Oct. 12 in his home at Highland Park, Ill. He was born in Worcester, Mass., in 1872, and was graduated from Worcester Polytechnic Institute in 1892 in the department of civil engineering. Mr. Knight's work brought him in contact with every phase of cableway design, construction and operation, and he made several improvements in cableways, notably in excavating buckets and aerial dumping appliances. He is survived by a son, Frank B. Knight.

THOMAS K. NIEDRINGHAUS, 64 years old, vice-president and director of the National Enameling & Stamping Co., Granite City, Ill., died early last Sunday morning at his residence in St. Louis. Death resulted from heart disease after a two weeks' illness that had not been regarded as serious. Funeral services were held Tuesday afternoon with burial in Bellefontaine Cemetery. Mr. Niedringhaus was born in St. Louis in 1860, the son of Frederick G. Niedringhaus, who went to St. Louis in the early fifties. Mr. Niedringhaus' father, who came from Germany, started in a small way as a tinner. The elder Niedringhaus and his brother William F. Niedringhaus, opened a plant for stamping tinware, which later became the St. Louis Stamping Co. and in 1899 the National Enameling & Stamping Co. Thomas K. Niedringhaus attended Manual Training School and Washington University in St. Louis, and Wesleyan University at Middletown, Conn., then entering his father's employ in 1880. He was made secretary of the Stamping company and when it was merged into the National Enameling & Stamping Co. he became vice-president and director. He was married in St. Louis in 1888 to Miss Jennie B. Johnson, and she and a son, Thomas K. Niedringhaus, Jr., and a daughter, Mrs. C. R. D. Meier, survive. Mr. Niedringhaus had served as chairman of the Republican State Committee and as Republican National Committeeman from Missouri. He was a member of the St. Louis Noonday University and other clubs in St. Louis, Chicago Club in Chicago, Union League Club in New York and the Cumberland Club in Portland, Me.

SAMUEL HALE, formerly vice-president of the Interstate Iron & Steel Co., Chicago, shot and killed himself at Santa Fe, N. M., Oct. 25. Mr. Hale had been in ill health and had gone to the Southwest in the hope that a change of climate would aid him. Funeral services were held at Kenosha, Wis. He was vice-president of the Interstate company from December, 1916, until four years ago, when he retired. He started his career as a young man in Youngstown, Ohio, and was subsequently identified with the Wisconsin Steel Works, Chicago, and as general manager with the Algoma Steel Corporation, Sault Ste. Marie, Ontario. He was 56 years old.



## Slag Brick and Other Slag Products

(Continued from page 1131)

River banks as rip-rap. In the past three years approximately 80,000 tons of this size have been used along the Mississippi River. The other sizes produced are used in many types of construction, such as concrete highways, foundations, reinforced bridges and buildings, and various patented types of pavements.

Slag has been found to be ideal for the last-named types of highway construction on account of its natural bonding properties. It has also been used in sewage filtration plants and by the railroads for ballast. The demand for slag produced in this manner has gradually increased each year, and at the present time about 60 per cent of the slag produced by the furnaces is sold commercially. During the year 1923, over 1,000,000 tons were sold by the slag company, composing approximately 26,000 carloads. As a result of a series of tests, slag was found to produce a stronger concrete than either stone or gravel, due to its abrasiveness forming an ideal bond with the mortar. Today it is accepted by all engineers and favored by many on account of the dependability of the grading of the various sizes.

### Modern Slag Brick Plant

In the manufacture of these various sizes of slag, about 10 per cent of the production will pass through the  $\frac{1}{4}$ -in. screens and is known as slag sand, having a gradation about the same as a good concrete sand. After a series of experiments it was found that this finely crushed material possessed a certain amount of cementing qualities. The demand for the various concrete products was investigated, and it was decided to manufacture concrete brick. After visiting brick plants in various parts of the country and consulting operators as to the type of machinery, methods of curing, etc., a plant was designed and built with a capacity of 30,000 brick per day and sufficient shed storage for 1,000,000 face brick.

[The author gives a description of the plant finally adopted to make successfully the slag brick, both common and face grades.]

The finished product is a brick of unusual strength, which increases with age and bonds with the mortar, producing a semi-monolithic wall, and is used in every type of construction. A concrete brick is not an imitation of clay or shale brick, but is a brick obtained by a different method of manufacture and using different materials. Concrete brick are just as hard and water-proof as clay or shale brick. They bond readily with the mortar and will not break away from the mortar in the wall because of expansion. This is due to the fact that mortar and concrete brick are composed of ingredients so nearly alike that the coefficient of expansion is practically the same. Because of the fact that they are not burned, no deformities occur from uneven distribution of heat, as is the case with a clay or a shale brick, and a concrete brick once made true remains true throughout.

Although these bricks are manufactured in the heart of one of the best clay brick deposits in the south, and in the midst of the coal fields, the demand for them has steadily increased since operations were started. The market price of concrete brick in the Birmingham district at the present time is \$12.50 per thousand for common brick and from \$22.50 to \$33.50 per thousand for face brick. The market price of the concrete common brick is about the same as the market price of the clay common brick, but the price of the concrete face brick, in most instances, is lower than either that of the clay or the shale face brick.

### Discussion on Slag Brick Paper

P. J. Freeman, chief engineer of tests and specifications of the Public Works Department of Allegheny County, Pittsburgh, drew attention to the fact that the outlet for slag brick could take care necessarily of only a very small proportion of the output of slag. As a matter of fact, he stated that there was no manufacture of slag brick in the Pittsburgh district, but that large quantities of concrete blocks were being produced from slag in that district. With the enormous amounts of slag produced, some good use must be found for the material to take care of the growing scarcity in available material for use as concrete aggregates. Slag for this purpose, particularly where large masses of concrete have to be placed, would form a splendid material.

## Scrap Iron and Steel—Metallurgical Phase

BY E. J. LOWRY\*

*E. J. LOWRY has studied at Harvard University and at E. Massachusetts Institute of Technology. His career as a metallurgist shows steady progress from foreman of the steel foundry of the Watertown Arsenal on to metallurgist at the United States Cartridge Co. and at the Oliver Chilled Plow works, South Bend, Ind. At the South Bend works, he carried on researches in malleable and gray iron and in steel. A few years ago he joined the staff of Hickman, Williams & Co. as metallurgical advisor to foundrymen. His activities have included the publication of various papers covering the technical and non-technical sides of raw materials used in iron and steel making.*



E. J. LOWRY

THE increasing use of scrap in the iron and steel industry promotes the conservation of our natural resources. Every ton of scrap consumed in the manufacture of steel saves for posterity a definite amount of raw materials, which will remain stored in nature's warehouse as our legacy to future generations. The tonnage of iron and steel manufactured yearly and the production of scrap move in a definite relation. It is therefore essential that the scrap heap be consumed in order to forward the spirit of conservation.

Accumulated scrap is of all descriptions, weights and analyses. But without regard for metallurgical considerations, it is shipped to the consumer upon speci-

fications of untrue value. Today, scrap is looked upon in the light of its name, whereas it should be evaluated on the basis of its ability to return economy and perfection to the consumer. For the legitimate future of the scrap business, it is essential that metallurgical adaptations be set forth as a requisite to progress in the right direction.

It is for the purpose of aiding in the enlightenment of the consumer, producer and seller of scrap iron and steel that this paper is written.

### Metallurgical Considerations

The manufacture of steel is of a complex nature. Its production entails both physical and chemical fac-

\*Metallurgist, Hickman, Williams & Co., Chicago.

tors. Many processes have been evolved to produce steel under different modes and with different materials, the most universal of which is the basic open-hearth process. The discussion will be confined mainly to this type of process.

Some of the governing factors in the use of scrap in the open-hearth are:

- The grade of steel to be made.
- The chemical elements required in the charge.
- The slag volume.
- The quality of the scrap.
- The effect on the life of the furnace.
- The weight per cubic foot of scrap in comparison to its over-all dimensions.
- The ultimate cost of the metal in the ingots.

[A detailed discussion of each of these subdivisions of the subject follows. The remarks concerning the presence of alloying elements are particularly important.]

#### Specifications

Scrap is purchased on mill specifications. It is shipped in accordance with these guides. The shipments, however, are governed, more or less, by the experience of the dealer with the consuming mills. It is the latter which really govern the quality of the scrap shipped. This condition is brought about because of the anomalies existing in the present specifications.

The grade, "No. 1 heavy melting steel," is covered by mill specifications. Those in existence today do not serve the purpose for which they were originally written. Instead of serving as a direct guide to the quality of scrap which might economically be used in the various mills, they are a subterfuge under which all grades of steel scrap, not especially described, may be shipped.

As an illustration of this, the following typical specification for No. 1 heavy melting steel has been taken as evidencing the inadequacy of such scrap descriptions.

Railroad steel, such as axles, angle bars and splices, couplers and knuckles, cut steel bolsters, coil and leaf springs (all coil springs to be of ½-in. or larger diameter steel), crop ends from billets, blooms, sheet bars, structural shapes, rods, bars and plates (not needle or skeleton scrap), draw bars, heavy forge scrap, butts, rail ends and new mashed pipe ends (original diameter 4 in. and over, thoroughly flattened), oil well drill stems, bits and jars, clean iron and steel No. 2 Wrought, car body plate ¼ in. and heavier when cut 12 x 12 in.

The above is a composite of the heavy melting steel classification used by mills throughout the country. If this specification were analyzed the following would be apparent:

(1) Many of the kinds of railroad scrap listed are now sold as special grades of steel and bring a premium over the regular heavy melting grade. These special grades shown are: Coil and leaf springs, couplers and knuckles, draw bars and steel axles.

(2) Some of the scrap steel included in the specification would be sold as low phosphorus grades. These also bring a premium over heavy melting steel and therefore would not be shipped on such orders.

Exclusive of the railroad grades, the low phosphorus scrap shown are: Forging steel scrap, plate scrap, oil well drill bits, jars and stems.

(3) Some of the kinds named in the classification come under the grades used by gray iron and malleable iron foundries: Angle and splice bars and rail ends (3 ft. and under).

(4) Eliminating "crop ends of billets, blooms, sheet bars, etc.," from consideration, due to their being an intermittent source of scrap for the average dealer, the following grades remain, which actually are disposed of constantly as heavy melting steel: Cut steel bolsters, rods and bars, structural shapes, new mashed pipe (original diameter 4 in. and over, thoroughly flattened) and cut bar sides (12 x 12 in.)

[Mr. Lowry discusses at this point a more modern method of evaluating scrap, as a result of which "each grade would become a specialty and be bought on that basis."]

#### The Specialty Markets

The blast furnace, the acid open-hearth, the electric furnace, the converter, crucible, cupola and malleable foundries, and in some instances the basic open-hearth plants are consumers of special grades of scrap iron and steel.

The blast furnace is an important consumer of some grades of scrap. The tonnage used is on the increase. Blast furnaces are looking into the use of scrap, more and more. The reason for this is obvious when one considers that without additional fuel, the total burden may be increased 5 to 8 per cent with "free" melted scrap.

The acid open-hearth melters have more or less severe problems to meet. Consequently, their specifications have been constantly revised to take care of the existing exigencies of the times. They, too, have neglected, however, the effect of the weight per cubic foot in comparison with lineal dimensions.

The converter and crucible foundries have, through their years of experience, learned that certain grades will lend themselves to their requirements. Naturally, the specifications covering the purchase of their scrap have a very definite purpose.

The same holds true for those basic open-hearth plants which require special grades in the manufacture of their products. These are the plants which are operating on very high percentages of scrap. In one instance where the furnace charge is upwards of 90 per cent scrap, the plant is an important consumer of "couplers and knuckles."

The electric furnace has proved a source for the consumption of various special grades of scrap. The tonnage of steel produced from such units has increased enormously during the past 12 years. It is recognized that the greater amount of this steel is made from Bessemerized hot metal, but the ever increasing small castings foundry is a factor to be considered. Here we find, in addition to the kinds shown in the previous list, the consumption of such grades as punchings, nail whisks, shovelings, etc. These furnaces operate on 100 per cent scrap and are either acid or basic lined.

The electric furnace producing ferroalloys provides another consumer of shoveling turnings. This development is of recent years and consequently lessens the supply of this melting stock.

Then, there is the gray iron foundryman who, during the past few years, has been disillusioned. He had long supposed that good gray iron castings required "at least 50 per cent pig iron." Today, by proper operation, good castings are produced with 100 per cent scrap. A striking illustration of this advancement is the chilled iron car wheel manufacturer.

One of the most interesting scrap-consuming developments of the past few years is the Kranz process for the production of malleable iron. This method of making malleable castings has sidetracked pig iron altogether and scrap with ferroalloys rules the mixtures.

These instances have been cited in order to show the ever increasing utilization of scrap in the manufacture of iron and steel products. They also show that the general trend is toward specialties rather than general specifications. In other words, perhaps the minor industries are leading the way for the major producers in giving scrap a value that it deserves.

#### Statistics

[Here follows a full discussion of the various sources of scrap. "The total annual tonnage of scrap produced in the country, by taking 10-yr. averages, shows an amount of 24,863,644 tons."]

The 11,000,000 tons appearing on the market have long been offered by grades. In some instances the tonnages offered have been gross tons, and, then again, other grades are net ton offerings. The Eastern States have fairly well standardized all their grades on the gross ton basis, while in the West a mixed condition of net and gross still appears.

It is now advocated that the standardization be changed in the East to the net ton basis and the mixed classification of the West be eliminated in favor of the net ton standard. This is against the present trend of opinion, but when one considers the problem from the accounting end, the amount of labor saved by the net ton standard will immediately become obvious. It is, therefore, hoped that this suggestion will be accepted.

The price of pig iron should have a direct relation to the value of scrap. When pig iron is high and scrap low, the consumer should take advantage of the situa-



tion and alter his mixtures to take care of increased percentages of scrap.

Scrap is an essential in the production of good castings. With careful manipulation of the melting medium, the percentage of scrap may be raised to 100 per cent without creating casting losses. The same is true in ingot production. Of course, in the large steel plants there is an amount of hot metal which must always be consumed. But in the smaller mills, without blast furnaces, 100 per cent scrap mixtures should be approached when conditions warrant their use.

Scrap should have a direct relation in price to that of pig iron. Likewise, a grade of scrap should be given a value which compares with its ability to return economy. Up to the present time, the relation of prices between pig iron and scrap has been rather chaotic.

#### Railroad Scrap

The railroads of this country are among the largest producers of scrap. They have made marked strides in the classification of their grades. The most notable work was performed by the Railway Storekeeper's Committee at Atlantic City in 1921, when specifications shown in Circular No. 2193 were adopted. Certain railroads have ignored these classifications, thus creating confusion in bidding on their scrap lists.

There are various methods of offering scrap on the market. Certain railroads would clear away an awkward position if they would eliminate their present practice of sending out "blank" lists. A dealer would have better chances of bidding if he knew the tonnages involved. The equipment in which scrap is shipped is an important consideration to the consumer. If the consumer requires a bottom drop car for cheap handling

of a material, it is perhaps essential to economy that he be given this type of equipment. Again, it would prove a great drawback to the consumer of car wheels if they were shipped in box cars.

Finally, the meeting at Atlantic City advocated the following: "Net ton: It is further recommended that the sale of all scrap be made on a net ton basis." This is cited to bear out the contention made in the earlier part of this paper. It is believed that if this were generally accepted, along with an adjustment of freight rates on the net ton basis, a forward movement in the scrap business would be felt.

#### Consumers and Dealers

[The author here discusses some matters involving the attitude of both consumers of and dealers in scrap.]

#### Summary

1.—The scrap industry, in volume of tonnage, has grown to take its place alongside of pig iron, though second in rank in the production of steel. It serves as a medium for the conservation of the natural resources of the United States.

2.—Steel is produced of better quality and in greater volume per unit of time at less cost by the use of scrap.

3.—The metallurgical phases are all-important to the growth of the scrap business.

4.—A new and more concrete specification covering the grades of scrap is required by the industries.

5.—Railroads, dealers and consumers alike have problems which are yet to be cleared away if the scrap business is to be elevated to its proper rank in the iron and steel industry.

## Scrap Iron and Steel—Commercial Phase



W. V. PHILLIPS

W. VERNON PHILLIPS was born in 1875 near Newport, England, of a tin plate manufacturing family, coming to the United States in 1882; settled in Philadelphia, where his father, F. R. Phillips, did much to establish the tin plate industry in America. Through his friendship with W. H. Perry of Providence, F. R. Phillips and his sons early became interested in the scrap business, resulting in 1912 in the formation of the Perry, Buxton, Doane Co., of which Mr. Phillips now is chairman. Upon the death of his father in 1904, he became president of F. R. Phillips & Sons Co., iron merchants and exporters, in which his three brothers are associated. He also is president of the Ettenger-Phillips Co. and the Phillips-Laffite Co. During the War he was chairman of the American Iron and Steel Institute committee on steel scrap and was also chief of the steel scrap division on the War Industries Board.

STEEL scrap for the basic open-hearth furnace probably represents 80 to 90 per cent of the iron and steel scrap consumed today. It is not so long ago that the major portion of all ferrous scrap was used by rolling mills, either for direct rolling, piling, shingling, busheling or puddling. During the last generation a two-fold change has taken place, due to the greatly reduced operation of the rolling mill, and the expanding use and wider practice in the open-hearth. The scrap dealer and producer has had gradually to change his method of preparation and study the needs and possibilities of the open-hearth; while the steel mill has had to study the problem of using a greater variety of scrap and of accepting more liberal specifications.

#### Quarrels Over Quality

During periods when demand is normal, the mills, while ordering a strictly No. 1 specification, accept an average class of steel scrap. When the demand increases they become more liberal in their inspection, as they are in need of the material, but the moment the supply meets the demand, the mills fall back on the strict specification and require a grade of scrap which the dealer not only cannot supply, but during normal

times has not been expected to supply. This is the crux of the whole situation.

The Purchasing Agent's Association has endeavored, in conjunction with the Department of Commerce, to correct this situation by drawing up new specifications even more severe than the old ones, forgetting, or not knowing, that the root of the trouble is in the strictness of the present specification.

The truth of the matter is, there is not sufficient high-grade scrap to meet the needs of the mills when they are running normally. When operations fall off they secure an ample supply of good scrap, but when demand exceeds normal (and by normal we mean 60 per cent) they must accept a proportion of poorer scrap. Thus we have the paradoxical condition of "the higher the price, the poorer the scrap."

A possible cure for this condition would be continuous buying of scrap by the mills, thus reducing the wide fluctuation in prices which are so costly to the mills and of no benefit to the dealers. This partial elimination of price fluctuation would tend to stabilize the grade of scrap. The dealer knows what is normally acceptable and ships his scrap to suit the market, exercising great care when shipping on the dull

markets, and carrying his poor grades until a strong demand sets in.

Price variations are greater in scrap than in any other of the steel commodities, averaging about 35 per cent annually. Over a period of 20 years prior to the war, the yearly average variation in the price of heavy steel melting scrap represented \$4.67, while since the war (eliminating the war years) the average variation has been \$7.25. The average pre-war price of scrap was \$14.00, the post-war average, \$17.85. This is based on average monthly quotations, and does not represent the average selling price, which would be much higher, as the big tonnages are sold on the high markets when the demand is great, while comparatively little material is sold at the low points.

It is useless for the mills to say that they will take only the highest grades. The dealer cannot discriminate when he buys; he just takes the entire locomotive. He cannot buy the choice part of a ship, a building or a bridge, or the acceptable parts of a freight car. What is he going to do with the portion that runs slightly under  $\frac{1}{4}$  in. thick? It is all acceptable and desirable enough when the mills want it, but if a few pieces of steel on a car run under specifications on a falling market, the entire car may be rejected.

As a rule, the dealer tries hard to ship what he has sold; he is punished so severely when he fails to do this that there is little incentive to try to "get by" with inferior material. The dealer was formerly able to deliver steel to Pittsburgh at \$14 (the average price before the war) and make a profit. Today the high cost of transportation and labor have increased the cost to \$19.25, based on buying the unprepared material at the same price, and using an average outside point for freight rates. Thus a \$19 market today is not nearly so good as was \$14 then.

#### Supply and Demand Govern

While scrap has an intrinsic value based on its metallic content when compared to pig iron, it is still the sole creature of supply and demand. Were it not for the dealers' yards and purchases by operators, it would cease to have any value when mills are not operating; and while blast furnaces may close down, scrap continues to be produced, and if too far from a dealer's yard, must lie dormant until demand lifts the price to a point which admits of its moving toward the nearest point of consumption.

Thus, as demand improves, the circle widens. When operations are very slack, only the scrap in the immediate vicinity of the mill is purchased; then, as demand increases, the freight rates come into play, and from that point on it becomes almost entirely a question of freight, until Pittsburgh mills will reach out to Canada, to far Southern points, and finally abroad, until the incoming flood of scrap from the far corners of the earth satisfies the greedy mouth of the open-hearth. The moment this becomes apparent, prices go off and the circle begins to contract.

In addition to this geographical condition, the speculative element enters. Producers, dealers, brokers and operators who normally sell 30 days' supply ahead go onto a hand-to-mouth basis, as the market advances, until the moment arrives when prices show signs of breaking, then large tonnages are offered for sale from all quarters. I was profoundly impressed with this when the Armistice was signed. The day before, we were getting only the scrap being produced from day to day, the price was fixed at \$30, and there was no incentive for anyone to sell more than they had ready to load. Furthermore, with the apparent shortage, there was always the possibility of an advance, so no one felt the necessity of selling short. But on the day after the Armistice there was one month's supply, or 1,000,000 tons of scrap, for sale. Mind, there was no more scrap in the country than on the day before, but there was every reason to look for a decline in price.

#### Certain Kinds of Scrap Taboo

Scrap used to be scrap, but woe to the dealer who would now ship 0.80 per cent chrome on a nickel steel order, or 0.05 per cent sulphur on a low-phosphorus

steel order. He must keep out manganese steel, since the mill's magnet won't lift it, and he thanks God that vanadium uses itself up, as it has no evident way of showing itself. He must not ship street car rails, as the cast iron welds may be very high in sulphur, and if there are no welds, they are sure to contain a lot of concrete or cement, and yet they must be melted by someone. He must not ship bushy turnings, though the blast furnaces are constantly calling for more turnings; meantime the machine shops are installing more automatic machines daily, running at high speeds and turning out more bushy turnings.

No, scrap no longer is just scrap, it is fast becoming a manufactured product. A modern yard capable of preparing scrap to meet mills' requirements represents outlays running into hundreds of thousands of dollars, starting with trackage, locomotives, overhead and locomotive cranes, derricks, magnets, shears, drops, compressing machines, machine shops, and last but not least, torching outfits with their generators and equipment.

The scrap market is not unlike the stock market in that it anticipates improvement and depression sometimes by several months. It is a common occurrence to see scrap prices rising while finished steel is still falling, but it invariably predicts an improvement in demand, which eventually means higher prices for finished steel. Likewise, scrap often begins to fall before finished material has stopped advancing. There are times when this is not borne out, and the rise in scrap proves to be a false start, but it usually is a good barometer.

#### Discussion

Discussion on the two scrap papers brought together the points of view of the producer of scrap, the dealer and the consumer.

Joseph Michaels, president Hyman, Michaels & Co., scrap merchants, Chicago, pointed out that with the tremendous quantities of light weight scrap being produced, particularly by the automobile manufacturers and through the medium of the rusty steel cars getting into the hands of scrap dealers, there will have to be an agency to use up this material. The consumer no longer can pick and choose the heavy weight scrap as his sole material. In other words, the open-hearth industry must adjust its practice to the use of the lighter material, or perhaps to a mixture of the lighter material with such heavy material as is available. In the Detroit district only, which includes the Northern section of Indiana, some 60,000 to 70,000 tons of automobile scrap per month comes on the market.

Another factor in connection with the scrap problem has to do with the re-rolling industry, particularly as regards rails. This industry uses up from 800,000 to 1,000,000 tons of steel per year. Formerly the specifications for the buying of this steel were very rigid, resulting in many rejections and much duplicate handling of the material at high cost. Present conditions permit the sale of all the material as it comes along, and then only the occasional resale of a small amount of the material. The cost of this resale and the loss resulting from it are far lower than the cost of adherence to the old rigid specifications.

Albert Mann, vice-president Illinois Central Railroad, Chicago, referred to scrap as a by-product of railroad operations. Its classification began about 1906, when the railroads started to study the scrap market and the character of scrap produced by the railroads. From this study has come the grouping or classification which became codified in 1921 and now is almost universally the standard practice of the railroads.

In addition to these standards we now have many separate grades handled individually, such as car wheels, axles, etc., in separate carload lots, which makes a more intimate sub-division than the standard class. Ahead of us shortly will be another group, consisting of alloy steels, which will have to be handled separately.

It is found usually that the consumer will not pay the railroad the price which the dealer will pay for scrap becoming available. The dealer acts as a clearing house, and as a result only a very small proportion



of the railroad scrap available goes direct to the consumer. As a matter of fact, the heavy melting steel so much in demand by open-hearth interests is a scarce article in railroad scrap. A whole year's accumulation of this scrap on a large road may not satisfy a single month's requirements of a large consumer.

W. A. Maxwell, Jr., general superintendent Indiana Harbor plant, Inland Steel Co., pointed out that the quality of the pig iron used in open-hearth practice governs to a large extent the amount and character of scrap used. An acid open-hearth steel is superior to basic, not because a superior quality of scrap is used, but mainly because the acid slag better de-oxidizes the steel and thus does away with those elements which make for poor quality. Steel made from a very high iron charge results in a high cost of the ingots for a number of reasons: it usually is over-oxidized, there is a heavy iron loss through oxidation of metalloids, etc. The speaker made a plea for a classification of scrap on the basis of weight per cubic foot and particularly for the production or preparation of scrap so that this density measurement would be high.

He declared that the quality of scrap used in his plant in May and in September showed a wide variance in operating efficiency, the tonnage of ingots being approximately the same in the two months, but the average number of furnaces at work in March was only 9.7, compared with 10.9 in September. The quantity of heavy scrap available in March was much greater than in September and he believed that the September ingot tonnage could have been produced with one less furnace if the scrap conditions of March had prevailed.

## History of Pittsburgh Plus Given in Detail

(Concluded from page 1121)

States Steel Corporation and its subsidiaries alone were made respondents; and that if we are patient and reasonable we shall find, though with perhaps some additional work and cost, the industry, taken as a whole, and including both producers and consumers, will not materially suffer by reason of the elimination of the Pittsburgh plus system.

"But for one, your president entertains the opinion that there are involved questions more important than those which are only of a legal nature. What is the fair, the equitable view to take? What is just as between producers and their purchasing acquaintances?"

"What has been done has caused considerable confusion, some injustice, perhaps some demoralization and unreasonably low returns on investments. But it is to be hoped that all difficulties will readily be overcome and that, in these matters, the entire steel industry will have the patience, the energy and the wisdom to solve the perplexities occasioned by the effort to abrogate the Pittsburgh plus and before long return to the position of progress and prosperity to which it is entitled.

"If every one of us will persistently deal with all others fairly, we shall receive our just deserts. If we charge only reasonable prices, taking into account the amount of investment, risk of business, vicissitudes of trade, depreciation and upkeep, treat our employees with liberal propriety and acknowledged standards of humanity, conserve the interests of our stockholders or owners, act decently and friendly toward our competitors, carefully consider the demands of public sentiment when we know and understand them, and always obey the laws of the land when they have been made known, then we may expect to prosper and to receive what is our due.

"We can afford to submit to a public sentiment, however created or brought about, if and when we are not called upon to sacrifice a moral principle. Then, maintaining this attitude, when such a sacrifice is demanded, we can stubbornly oppose and defend against it, and expect sooner or later to receive commendation and support.

"The highest and best rewards come from honest and proper practice. Bad results in the long run come from selfish, unfair and dishonest conduct."

## INSPECTION AND ANNEALING

### Essential to Avoid Defective Castings—Causes of Rejections

Stressing the importance of careful inspection and of annealing as the best ways to avoid defective material, Col. James Milliken, president Pittsburgh Testing Laboratory, Pittsburgh, gave several interesting examples in a talk before the Pittsburgh Foundrymen's Association, at its regular monthly dinner and meeting at the General Forbes Hotel, Pittsburgh, Oct. 20. Colonel Milliken, whose subject was "Is Inspection an Evil or a Blessing?" said in part:

In examining materials, defects are found, some of them serious in their nature, which represent an effort to cover up a condition which could not fail to bring rejection. I believe the greater number of cases of this kind occur more from a desire of an individual to shield himself from the criticism of his department head, or from ignorance of what the defect may mean when the piece of material is placed in service, than from any desire to really place defective material on the market or to be dishonest.

In complicated steel castings, shrinkage cracks are the principal trouble with which the inspector has to contend. There are many causes for these. Sometimes they are due to design. Many castings are designed by persons with little experience in pattern making or foundry practice. A great many shrinkage cracks, however, are caused by failure to carefully and properly anneal. Many losses occur due to the "penny wise and pound foolish" idea of trying to save money on the annealing with results which are sometimes quite serious.

I have in mind a case of a large fly-wheel which was to be run at high speed and which burst while undergoing an over-speed test. An examination of the debris disclosed the fact that some of the spokes had been cracked clear across in the original making. Someone in the shop had attempted to repair the spokes, or to cover up the cracks by chipping out the edges and filling in with welding material, chipping and filing the surface smooth, and re-annealing the casting, giving it such a nice, smooth, blue, hard scale covering that no one could see the hidden defects. No one saw these defects but the foundrymen. Inspectors could not see them because they had been deliberately hidden. A new scale had been developed by the second annealing. It had most serious results, for in its breaking one man was killed and three others badly hurt. If this casting had been properly annealed in the first place it is doubtful if the cracks would ever have developed. The right kind of inspection in this foundry in the early stages would have prevented an attempt to repair a casting in which the strength of its component parts was vital.

Taking at random from our records, 10 recent orders of cast iron pipe we inspected, manufactured at seven different foundries, in large sizes, there were 7353 tons manufactured and turned over to us to inspect. Of this lot 1029 tons, or approximately 14 per cent, was rejected. This does not take into account a certain tonnage rejected by the manufacturer in advance of our inspection.

Among the causes for rejection on this lot of pipe were core scabs, cracks and cuts, crushed sockets, cut head, scab head, mold strain, mold cuts, improper ramming, blacking cuts and holes, dirt hole, scale, cold shuts and defective beads, all preventable and caused mainly by carelessness in the making, drying, handling or placing of cores, or in pouring. If careful control of the product by both chemical and physical tests was not a good investment it would not be continued. In other words, improving the product cuts down the manufacturing loss.

More care in the supervision of the handling of cores, not only in the making, but in the drying and placing; and also more supervision of the pouring of the metal, would annually save the foundry business many thousands of dollars.

## British Iron and Steel Exports

WASHINGTON, Oct. 28.—Iron and steel exports from the United Kingdom in September aggregated 265,000 gross tons, valued at £5,305,000, as against 301,000 tons valued at £5,845,000 in August, and 335,000 tons, valued at £6,174,000, in September of last year, according to a cable received by the Department of Commerce from Acting Commercial Attaché Butler, London.

# Machinery Markets and News of the Works

## BUYERS AWAIT ELECTIONS

### Cleveland Board of Education Issues List of 70 Machines

#### Central Tube Co. in Market for 10 Tools—Lathes Particularly Active

GRADUAL improvement in demand for machine tools is reported as election approaches, but considerable business is undoubtedly being held back until after Nov. 4. Present buying is largely confined to small machines, buyers as a rule showing a preference for used equipment. Current purchasing does not seem to be confined to any particular class of user and new inquiries also come from varied sources. Lathe makers, in particular, report improved activity.

The Cleveland Board of Education has issued an inquiry for 70 machine tools for the Collinwood Senior High School, bids to be opened Nov. 10. The National Carbon Co., Cleveland, has issued a list of tools for its Edgewater plant, which includes a milling machine, surface grinder, tool and cutter grinder, drill grinder and bench drill.

The Standard Sanitary Mfg. Co., erecting a plant at Louisville, Ky., and the recent purchaser of about \$10,000 worth of electrical equipment, is continuing its purchases, having bought a number of polishing lathes. The Central Tube Co., Economy, Pa., expanding its plant, has just closed on six overhead electric cranes and is in the market for a list of 10 machine tools.

The A. O. Smith Corporation, Milwaukee, has placed another lot of 20 special manufacturing lathes and a list of seven tool-room lathes. The International Harvester Co. has closed on six turret lathes for Fort Wayne, Ind.

Prospect of the railroads figuring prominently in machine tool buying before the close of the year is seen in the appearance of a woodworking list from the Rock Island Lines. The New York Central is inquiring for a 24-in. vertical turret lathe.

Buyers from Japan, obtaining quotations for a government plant on a large number of tools, visited Cincinnati companies last week.

A large part of the surplus machinery of the Willys-Overland Co., totaling about 752 machines, offered last week at Toledo and Elyria, Ohio, was bought by Western dealers.

## New York

NEW YORK, Oct. 28.

WHILE there are evidently a fair number of inquiries for various types of tools under negotiation, a greater disinclination to place business becomes evident as election approaches. Should the result of the election prove satisfactory to potential purchasers, a fair volume of orders next month seems to be expected. A foundry contemplating purchase of various items of equipment is reported to have stated that its decision as to whether or not to buy will be made after Nov. 4. Recent purchases by railroads include a 100-ton bushing press bought by the Missouri Pacific.

The General Electric Co., Schenectady, N. Y., will soon begin the erection of a new five-story and basement plant unit at its local works, 150 x 150 ft., to cost about \$400,000.

Pember, Wittimore & Demers, Inc., 24 James Street, Albany, N. Y., architects, are completing plans for an automobile service, repair and garage building at 429-31 Central Avenue to cost about \$125,000 with equipment.

The Cerro de Pasco Copper Corporation, 15 Broad Street, New York, is said to be completing plans for the construction of new works at its properties in Peru, South America, to cost \$500,000 with machinery.

E. P. Townsend, 386 Fulton Street, Jamaica, N. Y., architect, has plans for a one-story automobile service, repair and garage building, 134 x 234 ft., at Fulton and Bergen Streets, estimated to cost \$75,000, for which bids on general contract will be taken immediately.

The Cuban Dominican Sugar Co., 129 Front Street, New York, with plants in Cuba, is disposing of a bond issue of \$15,000,000, the proceeds to be used in connection with the acquisition of the Sugar Estates of Oriente, Inc., and other sugar interests operating in Cuba and other islands of the West Indies, and for proposed extensions and improvements. Thomas A. Howell is president.

Emery Roth, 119 West Fortieth Street, New York, architect, has plans for a four-story automobile service, repair and garage building, 100 x 200 ft., at 3-17 East 102d Street, estimated to cost \$150,000, for which bids will be taken at once on general contract.

The Fahnestock Electric Co., 141 East Avenue, Long

Island City, manufacturer of electric battery equipment, connections, etc., will build a one-story addition, 50 x 100 ft., to cost \$17,000 exclusive of equipment. John Baker, 9 Jackson Avenue, is architect.

McCarthy & Kelly, 159 Remsen Street, Brooklyn, architects and engineers, have plans for a three-story automobile service, repair and garage building, 100 x 240 ft., at Second Avenue and Forty-eighth Street, estimated to cost \$200,000 including equipment.

The American Water Works & Electric Co., 50 Broad Street, New York, operating electric power utilities in Pennsylvania, Ohio, Virginia, West Virginia and Maryland, known as the Coal Field Super-Power Group, is arranging for an increase in capital stock from \$10,000,000 to \$50,000,000, a portion of the proceeds to be used for extensions and improvements. H. Hobart Porter is president.

The Board of Aldermen, Perth Amboy, N. J., is considering the installation of an additional unit at the municipal electric light and power station, for which estimates of cost and details will be arranged by Jay B. Franke, city electrician.

The Fred H. Bateman Co., Grenloch, N. J., recently organized, has acquired a portion of the former plant of Bateman & Companies, Inc., bankrupt, manufacturer of agricultural and farm implements. The new owner will remodel the buildings and plans to begin operations soon for a similar line of production.

Charles Miller & Co., North Bergen, N. J., operating a food-packing plant on the Secaucus Road, will build a power house in connection with a new two-story and basement packing house, the entire project estimated to cost \$130,000 with equipment, for which bids will be taken at once on a general contract. Himmelsbach & Schlich, 136 Liberty Street, New York, are architects.

The Central Railroad of New Jersey, 143 Liberty Street, New York, will soon begin the construction of a one and three-story building, 30 x 90 ft., at its shops at Elizabeth, N. J., to be used for sand-blast operations.

The N. P. Nelson Iron Works, Inc., 212 Fortieth Street, Brooklyn, has acquired about 5 acres at Allwood, near Passaic, N. J., and contemplates the erection of a new plant designed to give employment to about 100 operatives.

The Public Service Transportation Co., Public Service Terminal Building, Newark, operated by the Public Service Corporation, will proceed with the installation of equipment for a motor bus maintenance and repair works at the former



plant of the Day-Elders Motor Corporation, Twenty-first and Colt Streets, Irvington, recently acquired, one and two-stories, totaling about 90,000 sq. ft. of floor space. The equipment will include electric cranes, lathes, electric drills, cylinder boring and grinding machines, shift trucks, washing tanks, etc., and is estimated to cost \$50,000.

The Nuse Wagon Works, 92 Frelinghuysen Avenue, Newark, has awarded a general contract to the Drill Construction Co., 972 Broad Street, for a two-story addition, 25 x 88 ft., for automobile parts and repair work, estimated to cost \$25,000. Nathan Harris and Rudolph Kruger, Chamber of Commerce Building, are architects.

The Perfection Gas Filter Corporation, Mount Vernon, N. Y., incorporated with \$60,000 capital stock to manufacture gas filtering apparatus, plans to have parts made under contract. The company will maintain an assembling plant. Address care of J. H. Esser, corporate representative.

## Buffalo

BUFFALO, Oct. 27.

**B**IDS will be received by the United States Engineer Office, Buffalo, until Nov. 8 for seven steel barges, 100 x 30 x 6 ft., as per specifications on file.

The W. Bergman Hardware Co., 44 East Genesee Street, Buffalo, has plans for a new four-story building, 80 x 120 ft., estimated to cost \$75,000 with equipment. A. H. Hopkins, 447 Main Street, is architect.

The Pennzoll Co., Buffalo, will erect a new oil storage and distributing plant on Skillen Street, fronting on the line of the New York Central Railroad Co., to cost close to \$75,000 with equipment. It will replace a works destroyed by fire several weeks ago.

Manual training equipment will be installed in the three-story high school to be erected at Minerva and Main Streets, Tonawanda, N. Y., estimated to cost \$450,000, for which it is expected to ask bids on a general contract in about 60 days. E. B. Green & Son, 1 Niagara Square, Buffalo, are architects.

George J. Danner, Buffalo, has leased property at 322-24 Ellicott Street, 40 x 90 ft., and plans the establishment of an automobile and motor truck repair and parts works.

Joseph Keller & Sons, Buffalo, are planning the erection of a one-story machine shop at 1170 Elk Street.

Ruddell & Weigel, 123-27 Chenango Street, Buffalo, will build a one-story addition to their sheet-metal working plant at 158 Chenango Street.

## Philadelphia

PHILADELPHIA, Oct. 27.

**B**IDS will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until Nov. 4 for 35,000 ft. of cable for Philadelphia Navy Yard, schedule 2808.

C. M. Roswell, 1162 Marlyn Road, Philadelphia, machinery dealer, has inquiries out for three motor-generator sets, 125, 75 and 50-kw. capacity respectively, with 2200-volt, three-phase, 60-cycle motors and accessory equipment, also for nine transformers, 25 kva. and smaller, 6600-volt primary side and 110-220-volt secondary side.

Fire, Oct. 20, destroyed a portion of the plant of the Acorn Iron & Metal Works, Swanson and Christian Streets, Philadelphia, with loss reported at \$80,000 including equipment. It is planned to rebuild.

Joseph Margolis, 1505 Race Street, Philadelphia, architect, has plans for a two-story automobile service, repair and garage building, 75 x 87 ft., estimated to cost \$50,000.

S. Heiceman, Philadelphia, has awarded a general contract to Henry P. Schneider, York Road and Erie Street, for a one-story machine and repair shop at 1502-6 West Thompson Street, to cost \$25,000.

The Publicker Commercial Alcohol Co., Swanson Street and Snyder Avenue, Philadelphia, contemplates the construction of a power house at its proposed new plant, consisting of a group of eight buildings, estimated to cost close to \$2,000,000 with machinery. Clarence E. Wunder, 1520 Locust Street, is architect. Harry Publicker is president.

The Foreign Trade Bureau, Philadelphia Commercial Museum, has received the following inquiries: 42765, from Andres Hurtado, Reconquista 316, Buenos Aires, Argentina, desiring to get in touch with American manufacturers of tools and equipment for cooperage plants, also equipment for barrel production; 42751, from M. A. Cheik & Co., P. O. Box 253, Beirut, Syria, interested in getting in contact with American manufacturers of automobile fenders; 42746, from the Manufacturers' India Office, P. O. Box 452,

Bombay, India, desiring to get in contact with manufacturers of automobile and carriage brass and nickel body fittings, axles, springs and carriage lamps; 42700, from Felix de Bedout e Hijos, Edificio Bedout, Medellin, Colombia, wishing to get in touch with manufacturers of fire-arms, stamped metal ceilings, horseshoe nails, bookbinders' machinery, paper-making machinery and brewers' and bottlers' machinery; 42766, from Ajas Rahaman & Brothers, P. O. Box 479, Calcutta, India, interested in manufacturers of agricultural implements and machinery, metal castings, cranes, electrical apparatus, gas and gasoline engines, iron and steel pipe and sheets, tool steel, forging machinery, flour mill machinery, metal-working machinery, paper-making machinery, hot-air engines, machine tools, candle molding machinery, toolmakers' specialties, blacksmiths' tools, wire cloth, wireless apparatus and power transmission machinery; 42749, from J. & H. D. C. Gomes, Calle La Marina, Maracaibo, Venezuela, wishing to get in touch with manufacturers of builders' hardware, hardware specialties, carpenters' and cabinetmakers' tools, machinists', blacksmiths' and tinmiths' tools, and iron and steel tubes.

A power house will be erected in connection with the proposed linoleum manufacturing plant to be built by W. & J. Sloane, Inc., Fifth Avenue and Forty-seventh Street, New York, on a 72-acre tract acquired at Hutchinson's Mills, Hamilton Township, near Trenton, N. J., reported to cost \$450,000 with machinery.

Edward W. Peters, 103 Lower Mulberry Street, Danville, Pa., has inquiries out for a set of wheels for a Keystone excavator, No. 3 type.

The Liberty Can & Sign Co., Water Street, Lancaster, Pa., has awarded a general contract to Herman Wohlson, Woolworth Building, for its proposed plant on Plum Street for the manufacture of metal cans, containers, signs, etc., estimated to cost \$300,000 with equipment.

F. J. Miller, Brooks Building, Scranton, Pa., architect, has plans for a two-story automobile service, repair and garage building, 50 x 87 ft., to cost about \$45,000.

The York Haven Paper Co., York Haven, Pa., has work in progress on improvements at its plant including the installation of additional electric generating equipment in the power house and electrification of different portions of the mill, estimated to cost \$50,000.

The A. V. Kozak Co., 593 North Main Street, Wilkes-Barre, Pa., operating a marble and granite works, has plans for two one-story additions for polishing, finishing, etc., estimated to cost \$46,000.

The Common Council, Morrisville, Pa., is completing plans for the installation of two new electric-operated pumping units at the municipal waterworks, to replace present steam-operated equipment. A gasoline engine will be provided for auxiliary service. George Duke is chairman of the water committee.

The Peerless Spring Mfg. Co., Pacific and Bath Streets, Philadelphia, recently organized to manufacture springs and supplies for the furniture trade, has leased a two-story building in which production soon will be started under the direction of Walter Kiwi. It is in the market for several spring machines to make helical and cone springs, also for a milling machine and a large japanning oven. Wire, steel, machines and materials will be needed in the machine shop where the company will produce all of its tools and dies.

The Robeson Iron Co., Robeson, Pa., is in the market for 30 tons of 80-lb. rails suitable for rerolling. Splice bars are desired.

The Philadelphia Steel & Iron Co., 1008 Commercial Trust Building, Philadelphia, is inquiring for tonnages of bars 3 in. in diameter and up, also for all sizes of ship shafting.

The Bradford Brick & Tile Co., Machinery Division, Bradford, Pa., will purchase an open-side planer, 60 in. x 14 ft. x 16 ft., arranged for reversing motor drive.

## Detroit

DETROIT, Oct. 27.

**P**RELIMINARY plans are being considered by the General Machine & Iron Works, Plymouth, Mich., for a one-story machine shop estimated to cost \$18,000. The work is expected to go ahead early next year.

The AC Spark Plug Co., Flint, Mich., controlled by the General Motors Corporation, Detroit, has acquired about 23 acres fronting on the Belt Line Railroad and will use a portion of the site for the erection of two or more buildings for the production of special automobile equipment, including an air cleaner, and devices for gasoline engines. B. W. DeGulchard is vice-president and general manager.

The Industrial Works, Bay City, Mich., manufacturer

## The Crane Market

THERE is a fair volume of current inquiry for overhead traveling cranes, but with increasing pre-election dullness, a number of expected purchases are reported delayed pending the result of the election. Very little inquiry for locomotive cranes is noted, the few active ones now in the market being, as a rule, several weeks old. The Baltimore & Ohio Railroad has been negotiating for a 12½-ton overhead traveling crane for use on Staten Island, New York, and is expected to place the business from Baltimore, some time this week. An inquiry for a 100-ton overhead crane will probably be issued shortly by a New York company. Still pending is the inquiry of the New York Edison Co. for two 200-ton overhead cranes. One of the most active current inquiries for overhead cranes is from the J. G. White Engineering Co., 43 Exchange Place, New York, for a 50-ton, 45-ft. span, 4-motor crane with 10-ton auxiliary, for the Staten Island Edison Co.

The crane market in the Pittsburgh district shows a fair degree of activity in sales, but new inquiries are not as numerous. There is prospective business, however, in connection with the warehouse of the Jones & Laughlin Steel Corporation at Memphis and the new mills to be built in the Chicago district by the Youngstown Sheet & Tube Co.

Among recent purchases are:

American Locomotive Co., 50 Church Street, New York, a 10-ton, 96-ft. span, electric traveling crane, from the Shaw Electric Crane Co.

United States Cast Iron Pipe & Foundry Co., Burlington,

N. J., two 10-ton, 50-ft. span, electric traveling cranes for Birmingham, from a Mid-Western builder.

Phoenix Utility Co., 71 Broadway, New York, two 20-ton, 30-ft. 2-in. span, electric traveling cranes from Alfred Box & Co.

Thomas E. Murray, consulting engineer, New York, about 300 ft. of overhead track, several 3-ton and 5-ton hand power hoists and trolleys, switches and turntables for the Hell Gate power station of the United Electric Light & Power Co., from the New Jersey Foundry & Machine Co.

Central Tube Co., Economy, Pa., two 10-ton, 100-ft. span, one 25-ton, 46-ft. 2¼-in. span, one 10-ton, 96-ft. 6-in. span, one 10-ton, 70-ft. span and a 5-ton, 36-ft. 6-in. span, all double hook electric cranes, and all from the Alliance Machine Co.

Bethlehem Steel Co., Bethlehem, Pa., two charging machines and three cranes for the Lackawanna works, from the Alliance Machine Co.

Continental Heater Co., Dunkirk, N. Y., a 5-ton 50-ft. span crane, from the Northern Engineering Works.

Westinghouse Electric Products Co., Mansfield, Ohio, a 5-ton crane, from the Northern Engineering Works.

Carnegie Steel Co., a 15-ton floor controlled electric crane for the power house at the Mingo, Ohio, works, from the Northern Engineering Works.

American Steel Foundries, Chicago, a 5-ton electric gantry crane for plant at Granite City, Ill., from the Shaw Electric Crane Co.

of locomotive cranes, etc., is disposing of a bond issue of \$2,000,000, a portion of the proceeds to be used for expansion. E. B. Perry is president.

Everett B. Arnold, 18 Pilgrim Avenue, Highland Park, Detroit, architect, has plans for a two-story automobile service, repair and garage building at 8924 Grand River Avenue, 43 x 125 ft., estimated to cost \$60,000.

The R. B. Collis Sprayer Co., 190 Territorial Avenue, Benton Harbor, Mich., manufacturer of spraying and pumping apparatus, etc., has awarded contract to Joel Pearson, Stevensville, Mich., for its two-story addition, estimated to cost \$27,000. Homer Harper, Battlement Building, is architect. R. B. Collis is president.

The Tannewitz Works, Grand Rapids, Mich., is looking for carload lots of 16-gage and 10-gage pickled or soft sheet strips, ends or corners, capable of shearing into pieces 1½ in. wide and 2 ft. long.

## Chicago

CHICAGO, Oct. 27.

THE past week has been the most active of the month in the machine tool trade. Hesitancy attributable to the approaching election appears to be a factor of decreasing importance and buying, while not yet general in scope, is steadily gaining impetus. The A. O. Smith Corporation, Milwaukee, has placed another lot of 20 special manufacturing lathes, as well as seven tool-room lathes ranging from 14 to 30-in. swing. The Ajax Motors Co., Racine, Wis., has been placing cylinder block equipment and in the coming week will order crank shaft machinery. The Koehring Machine Co., Milwaukee, has distributed orders for two medium-size turret lathes, a gear cutter and a shaper. The International Harvester Co. has placed six medium-size turret lathes for its motor truck plant at Fort Wayne, Ind. The Sanitary Mfg. Co., manufacturer of plumbing brass goods, Abingdon, Ill., is in the market for approximately 20 turret lathes. The first railroad inquiry of consequence which has made its appearance for many weeks is a wood-working list issued by the Rock Island Lines. This has revived hope among machinery dealers that the railroads may yet figure prominently as buyers of machine tools before the close of the year.

### Rock Island Lines

All tools to be motor-driven

One Greenlee No. 426 medium duty self-feed rip saw.

One Greenlee No. 453 automatic cut-off saw.

One four-side 16-in. x 20-in. wood planer, Yates No. P-16 or equal.

One 4-in. Fay & Egan No. 326, or equal, molder and matcher.

One 12-in. jointer, Fay & Egan No. 506, or equal.

One Fay & Egan No. 453, or equal, belt sander.

One Greenlee No. 306, or equal, four-spindle horizontal boring machine.

One Fay & Egan No. 58, or equal, 42-in. band saw.

One Greenlee No. 502H, or equal, 12-in. round-head 12-ft. table car gainer.

One Fay & Egan No. 501-A, or equal, swing saw with 20-in. saw.

One Fay & Egan No. 400-D, or equal, 12-in. swing, 8-ft. centers wood turning lathe with motor in head.

One Fay & Egan No. 4, or equal, three-knife roundhead 16-in. universal wood worker or jointer.

Two Fay & Egan No. 452H double head ball bearing shapers with double end.

One Fay & Egan No. 6A, or equal, bench trimmer.

One Fay & Egan No. 470, or equal, jig saw.

One Greenlee No. 427, or equal, medium duty, direct connected self-feed rip saw.

One direct Greenlee No. 493M, or equal, combination rip and cut-off or variety saw.

One Fay & Egan No. 421, or equal, grindstone complete with 36 x 5½-in. stone.

One router with 36-in. table.

Joseph T. Ryerson & Son, Sixteenth and Rockwell Streets, Chicago, have awarded contract for a one-story transformer house, 15 x 72 and 8½ x 9 ft., at 2547 West Fifteenth Street, to cost \$8,000.

The Active Auto Products Co., 8 South Dearborn Street, Chicago, recently incorporated, has occupied a plant at 5642 Race Avenue and is manufacturing kitchen utensils and proposes to go into the manufacture of automobile accessories and miscellaneous steel products. The company will be in the market for equipment as its expansion program develops. Officers are John A. Kochannek, president and treasurer; Gotthard Tishawa, vice-president; Frances M. Kochannek, secretary.

The Minnesota Power & Light Co., Duluth, Minn., has arranged for a preferred stock issue to total \$2,200,000, a portion of the proceeds to be used for extensions and improvements. C. E. Groesbeck is president.

The Singer Paper Box Mfg. Co., 815 West Congress Street, Chicago, has awarded a general contract for its one-story plant, 125 x 130 ft., at 438-48 North Oakley Boulevard, estimated to cost \$45,000 with equipment. B. Leo Steif, 64 West Randolph Street, is architect. David M. Singer is president.

Manual training equipment is planned in the new three-story senior high school to be erected at Duluth, Minn., estimated to cost \$800,000, for which it is expected to ask bids on a general contract in December. Holstead & Sullivan, Palladio Building, are architects.

The Chicago Bearing Metal Co., 310 South Michigan Boulevard, Chicago has awarded a general contract to the Austin Co. for a new one-story plant, 67 x 150 ft., to cost \$20,000 exclusive of equipment. C. A. Bickett is president.

The Fort Collins Refining Co., Fort Collins, Colo., recently organized, has plans for the construction of the first



unit of an oil refinery with capacity for handling 3500 bbl. of crude oil per day, estimated to cost \$750,000 including machinery.

The Cedar Rapids Foundry & Machine Co., Cedar Rapids, Iowa, is in the market for a surface grinder and a punch press with at least a 2-in. stroke.

## Cleveland

CLEVELAND, Oct. 27.

**A**N inquiry for 70 machine tools for the Collinwood senior high school, Cleveland, has been sent out by the Cleveland Board of Education. Bids will be received Nov. 10. The National Carbon Co. has issued a list of machinery requirements for its Edgewater plant, Cleveland, which includes a milling machine, surface grinder, tool and cutter grinder, drill grinder and bench drill. The New York Central Railroad is inquiring for a 24-in. vertical turret lathe. A Cleveland manufacturer of automatic screw machines during the week received an order from Japan for five machines, making a total of nine placed by its Japanese distributor this month. The market continues quiet with few orders for more than single machines. Considerable business is being held back until after election.

Manufacturers report a good volume of business in prospect in heavy handling equipment. The Baltimore & Ohio Railroad has placed an ore bridge with the Heyl-Patterson Co., Pittsburgh, to replace the one in Lorain, Ohio, destroyed by the tornado last summer. Inquiries are pending for 10 coal and ore handling bridges, most of these coming from steel plants. Manufacturers in this territory also have inquiries for five car dumpers.

A large part of the surplus machinery of the Willys-Overland Co., amounting to 750 tools, offered at Toledo and Elyria, Ohio, the past week was bought by Western dealers. Much of the company's surplus machinery had been on the market for some time and had been picked over by dealers and the best equipment purchased. Consequently, according to reports a large share of that offered at auction was in poor condition and brought little more than scrap prices.

### *The Collinwood Senior High School List Elementary Pattern Shop*

One oil stone grinder.  
Six 12 x 20 in. wood-turning lathes.  
One 18-in. band saw.  
One bench trimmer.  
One bench saw.  
One 6-in. bench jointer.  
One 15-in. disk sander.

### *Advance Pattern Shop Equipment*

Six 12-in. x 20-in. wood-turning lathes.  
One 16-in. x 60-in. wood-turning lathe.  
One oil stone grinder.  
One 30-in. band saw.  
One 6-in. jointer.  
One 15-in. disk sander.  
One trimmer.

### *Machine Shop Equipment*

Two 2-wheel bench grinders.  
One 10-in. sensitive drill press.  
Ten 13-in. x 5-ft. lathes.  
Four 13-in. x 5-ft. lathes with taper attachments.  
One 13-in. x 5-ft. lathe with full tool room equipment.  
Seven 13-in. x 5-ft. lathes with semi-quick change gear mechanism.  
One extension bed gap lathe.  
One 16-in. crank shaper.  
One 16-in. back-gear shaper.  
One arbor press.  
One 20-in. wheel and lever feed drill press.  
One high speed metal saw.  
One 9-in. x 3-ft. bench lathe.  
One 14-in. sensitive floor drill.  
One universal shaper.  
One universal milling machine.  
One 24-in. x 6-ft. planer.  
One tool and cutter grinding machine.  
One universal tool grinding machine.  
One triple purpose furnace.  
One abrasive surface grinding machine.  
One constant speed drive back geared plain milling machine.  
One turret lathe.

### *For Other Shops*

One bench saw.  
One bench jointer.  
One electric grinder.  
One grinding and buffing motor.

The Fairfield Brick Co., Zoarville, Ohio, is having plans prepared for a \$150,000 plant. Robert N. Williams, Dover, Ohio, is president.

The Victor Stove Co., Salem, Ohio, contemplates the erection of a new factory to replace one recently damaged by fire.

The New Era Electric Mfg. Co., 4121 Woodland Avenue, Cleveland, will build a one-story factory, 50 x 83 ft.

The Folberth Auto Specialties Co., 7020 Lake Avenue, Cleveland, will erect a two-story factory, 60 x 202 ft., at 1311 West Eightieth Street.

The National Carbon Co., Cleveland, will erect a factory building, 75 x 120 ft., at Fostoria, Ohio.

The Brookins Co., 1741 Euclid Avenue, Cleveland, will erect a two-story factory, 35 x 140 ft., at Fortieth Street and Carnegie Avenue.

The Austin Co., Cleveland, has taken contract from the Detroit Insulated Wire Co., Detroit, for a building to be occupied by a wire drawing department and a contract from the Briggs Mfg. Co., Detroit, manufacturer of automobile bodies, for a storage warehouse. It also has a contract from the Continental Fibre Co., Philadelphia, manufacturer of vulcanized rubber, for a two-story plant of steel and frame construction, 139 x 280 ft., to be erected at Newark, Del.

The Etna Machine Co., 3400 Maplewood Avenue, Toledo, Ohio, has awarded general contract to the Berkebile & Sons Co., 313 Broadway, for a three-story and basement foundry, 60 x 85 ft. E. F. Abbey is president.

The Toledo Ignition Co., Toledo, Ohio, manufacturer of automobile ignition equipment, has leased a building, 100 x 100 ft., to be erected by the Toledo Factories Co. on Sixteenth Street, estimated to cost \$60,000. Sidney Aftel, Toledo, is architect.

The National Carbon Co., Fostoria, Ohio, has plans for the immediate erection of a one-story addition, 75 x 120 ft. It manufactures searchlights and kindred products.

## New England

BOSTON, Oct. 27.

**T**HE local machine-tool market has again become somewhat more active following a period of dullness lasting about a week. Current buying, however, is confined very largely to small machines, both new and old with used predominating, and covers a fairly diversified list of equipment. The largest individual order was for five hand milling machines purchased by a shipyard. Inquiries also are increasing and some old inquiries also are beginning to show signs of life once more. Small tools, gages and machine parts continue to sell freely.

The local machine tool trade is sending out warnings regarding a man who recently posed as a buyer of machinery in this market, and is now believed to be operating in Ohio. He is well versed in machinery and poses as in the market for a large amount of equipment. His method is to take up three or four days of a dealer's time, placing his order late in an afternoon or late Saturday morning, usually at about the time banks close or later. He then induces the dealer to cash one or more checks for him and departs for points unknown. His checks are worthless, and just now apparently are issued to him by a Boston machinery house. Police in two Southern States have warrants for his arrest. Some checks are issued in the name of a Texas automobile dealer. A letter is presented, along with the checks in this case, telling of the company's having sold the man's car and of the balance due him from the sale. The check or checks cover the amount of the "balance."

Bids are being taken for a three-story and basement, 80 x 100 ft. junior high school addition to cost \$175,000, and to include manual and vocational training departments, for Marlboro, Mass. Edwin T. Simonean is chairman of the commission. Charles M. Baker, 25 Arch Street, Boston, is the architect.

A. Grindin, Crescent Street, Brockton, Mass., contemplates the erection of a one and two-story garage and service station. Plans are private.

Plans are ready for a \$100,000 coal pulverizing plant for the Narragansett Electric Light Co., Providence, R. I., construction of which will begin in about two months. Jenks & Ballou, 10 Weybosset Street, Providence, are the engineers.

The Acme Apparatus Co., 186 Massachusetts Avenue, Cambridge, Mass., has started the erection of a one and

three-story, 26 x 66 ft. and 34 x 47 ft., manufacturing plant on Osbourne Street.

The city of Boston has awarded a contract for a \$1,300,000 three-story, 165 x 342 ft. high school on White Street, East Boston, in which will be located machine shops and woodworking rooms. Thomas P. Glynn is chairman of the commission. John M. Gray, 175 High Street, Boston, is the architect.

The Simonds Saw & Steel Co., Fitchburg, Mass., has purchased additional land on Columbia Road, South Boston, adjoining property recently acquired, which will be occupied immediately for manufacturing purposes.

Work will begin on a two-story power plant for the Gillette Safety Razor Co., 41 West First Street, South Boston, 70 x 75 ft., for which plans were drawn by Charles T. Main, 200 Devonshire Street, Boston, engineer.

The Hampden Mfg. Co., Westfield, Mass., has been organized to take over the plant and business of the Hampden Toy Co. The new company will concentrate on the manufacture of lunch boxes, clothes hangers and kindred products, curtailing the toy production. The works will be maintained temporarily in the Provin Block, as heretofore, and will later be removed to the Westfield Power Co. Building, where operations will be increased. George S. and Isidore Poulin head the new company.

The Springfield Body Corporation, Springfield, Mass., has acquired the plant and property of the Stevens-Duryea Motors, Inc., Chicopee, Mass., on a 34-acre tract and will occupy for extensions.

The Board of Trustees, Tilton Seminary, Tilton, N. H., is having preliminary plans drawn for a one-story steam power plant estimated to cost \$41,000, for which it is expected to ask bids early in the spring. A. S. Kellogg, 89 Franklin Street, Boston, is engineer.

The Lewis-Shepard Co., East First Street, Boston, manufacturer of lift trucks, elevators, etc., has plans for a one-story factory, 55 x 300 ft., estimated to cost \$65,000 with equipment. Clifford & Roebblad, 101 Tremont Street, are architects.

## Milwaukee

MILWAUKEE, Oct. 27.

**O**RDERS for machine tools have not shown a substantial increase, but judging by inquiry the past week, considerable business seems to be ready for closing as soon as the situation becomes more definitely settled by the result of the election. This factor undeniably has affected business adversely, and when it is out of the way the impression prevails that industry and trade will again hit a better stride.

The Kleckhefer Container Co., Milwaukee, manufacturer of paper, fiber and composition boxes, packages, etc., has awarded contract for a factory and warehouse addition to its main plant at Canal Street and the Sixteenth Street viaduct, and is now buying special machinery with electric motor drive. The total investment will be about \$80,000. John W. Kleckhefer is president and general manager.

The Prescott, Wis., Co-Operative Mfg. Co., capital stock \$100,000, has been incorporated by George F. Mercord, Samuel McDonald and William H. Stark for the production of automotive equipment, specialties, accessories and parts. It is planned to erect a factory during the winter.

The waste material and scrap metal plant of Benesch Brothers, Port Washington Road and the C. M. & St. P. R. R. tracks, Milwaukee, was damaged \$25,000 by fire on Oct. 23. Considerable handling equipment was badly damaged and will require replacement.

The Wadhams Oil Co., 359 Clinton Street, Milwaukee, has made public plans for an additional investment of \$100,000 in tank storage, warehouse and refining facilities at the main plant at Thirty-third Avenue and Lapham Street. Plans by A. H. Kienapple, architect, call for a two-story building, 100 x 200 ft. S. S. Cramer is president and general manager.

The Charles A. Krause Milling Co., Milwaukee, has placed the general contract for designing and equipping its new \$1,500,000 corn products plant at Thirty-third Avenue and Burnham Street with the Fraser Co., 667 East Water Street, Milwaukee. It will replace one almost totally destroyed by fire on Sept. 2.

Harry E. Weber, Inc., operating the Stewart-Warner Products Service Station at 582-584 Jefferson Street, Milwaukee, has engaged Van Ryn & DeGelleke, architects, 112 Grand Avenue, local, to design a new sales and service building, 60 x 120 ft. Bids will be asked about Nov. 1. Harry E. Weber is president and general manager.

## Cincinnati

CINCINNATI, Oct. 27.

**T**HE machine-tool market continues to show improvement in volume of inquiry and in the number of orders booked. The principal feature the past week was the visit to Cincinnati of several buyers from Japan who are taking quotations on a large number of tools for a Government subsidized plant. No orders have yet been placed, but action is expected shortly. Railroads have been buying some of the heavier type of machines. Lathe manufacturers report steady improvement in sales and a considerable increase in the number of planers booked. Dealers in new and used equipment report orders for the smaller type of machines more numerous, with inquiries increasing. A recent deal involved an order for \$10,000 worth of electrical equipment, including motors and starting equipment for a large shop being erected in Louisville, Ky., for the Standard Sanitary Mfg. Co. This company is continuing its purchases, having bought a number of polishing lathes, and will close soon for the remainder of its equipment.

The plant of the Wilmington Planing Mill Co., Wilmington, Ohio, recently destroyed by fire, will be rebuilt. Woodworking machinery will be required.

The Engineering Division, Air Service, United States Army, Dayton, Ohio, will take bids until Nov. 4 for 2500 lb. seamless steel tubing, circular 16.

The Smith Brothers Hardware Co., 32-62 West Chestnut Street, Columbus, Ohio, is having plans drawn for a new warehouse and distributing works, estimated to cost \$500,000, with metal shelving, fixtures, etc., and handling equipment. Bids will be called early in the spring. Snyder, Babbitt & Mathews, 1212 Hayden Building, are architects. D. E. Mooney is president.

The Signal Mountain Portland Cement Co., James Building, Chattanooga, Tenn., is said to be arranging preliminary plans for the erection of a third unit at its mill at Signal Mountain, to increase the output to about 4000 bbl. per day.

The Lookout Oil & Refining Co., Cedar Street, Chattanooga, Tenn., has preliminary plans for the establishment of a new department to manufacture tin cans, buckets and other containers. Mercer Reynolds is general manager.

The Jones & Laughlin Steel Corporation, Pittsburgh, is said to have closed negotiations for the purchase of 9 acres in the vicinity of Auction Avenue, Memphis, Tenn., a portion of the site to be used for a terminal and distributing plant for heavy and other steel products. The initial works are estimated to cost \$250,000 with equipment.

The Mills Equipment Corporation, Chattanooga, Tenn., has inquiries out for a four-roll pulverizing mill, immediate delivery.

## St. Louis

ST. LOUIS, Oct. 27.

**P**LANs have been completed by the More-Jones Brass & Metal Co., 314 North Broadway, St. Louis, for a one and two-story foundry and metalworking plant, estimated to cost \$350,000 with equipment. Klipstein, & Rethman, Chemical Building, are architects.

The Kaysing Iron Works, Inc., 2710 North Twenty-fifth Street, St. Louis, has acquired property at Seventeenth and Clinton Streets, and will erect a two-story branch plant to cost \$40,000. William G. Kaysing is president.

The Commercial Metals Mining Co., Joplin, Mo., H. J. Bradley, head, is planning the installation of mining machinery, electric power equipment, cars, conveyors, etc., on property acquired in the Surgeon mining district, near Joplin. A site of more than 1000 acres is available.

The Vinita, Bartlesville & Western Railway Co., Bartlesville, Okla., recently organized with a capital of \$1,000,000, is reported to be planning the establishment of locomotive and car repair shops in connection with its proposed new line from Vinita to Blackwell, by way of Bartlesville, 145 miles. C. E. Burlingame, L. A. Rowland and J. S. Leach, all of Bartlesville, are interested in the new project.

The Common Council, Wewoka, Okla., is considering the installation of electric-operated pumping equipment at its proposed municipal waterworks, for which a fund of \$150,000 has been arranged. V. V. Long & Co., Colcord Building, Oklahoma City, Okla., are engineers.

The Central Missouri Power & Water Co., Springfield, Mo., will build a hydroelectric generating plant on the



Gasconade River, near Arlington, Mo. The initial plant will have a total output of 35,000 kw., divided into seven turbine units of 5000 kw. each. A power dam 95 ft. high will be built. The entire project will involve \$1,200,000.

The Bradford Motor Works, Tulsa, Okla., manufacturer of automobile equipment, parts, etc., will erect a new one-story plant, 50 x 100 ft. The Sterling Engineering Co., New Wright Building, is engineer.

The Board of Education, Tulsa, Okla., will soon begin the erection of a three-story manual arts and training building at Ninth and South Cincinnati Streets, 140 x 150 ft., estimated to cost \$125,000. Leland I. Shumway, New Wright Building, is architect.

## Pittsburgh

PITTSBURGH, Oct. 27.

**M**ACHINE tool business is not particularly good, running chiefly to single tools and many for special uses against which it is not possible to apply standard tools. Most of the new inquiries also are for one or two items, although one good list is before the market, namely, the Central Tube Co., Economy, Pa., which includes 10 tools. This company has ordered six cranes in connection with the expansion of its plant and orders for machine tools are expected soon.

The National Tube Co. has bought two No. 5 alligator shears for its Gary plant from the United Engineering & Foundry Co. and the Standard Steel Car Co. has placed the order for a No. 3 gate shear with the Cleveland Punch & Shear Works Co. The Carnegie Steel Co., which has bought all the tools for its machine shop at its Homestead works, for which there was an appropriation, is regarded as a good prospect for additional purchases early in 1925.

The Clearfield Brick Mfg. Co., Clearfield, Pa., manufacturer of fire brick and other refractories, has plans for a three-story and basement building, 45 x 52 ft., and two one-story structures, 68 x 71 ft. and 35 x 36 ft., respectively, to cost \$50,000.

The Gem Mfg. Co., 1229 Goebel Street, Northside, Pittsburgh, manufacturer of special metal stampings, metal novelties, etc., has filed plans for a one-story addition to cost \$23,000.

The Board of Education, Hinton, W. Va., is considering the installation of a manual training department in its proposed two-story and basement high school, estimated to cost \$110,000, for which foundations soon will be laid. Wysong & Bengston, Professional Building, Charleston, W. Va., are architects.

The Guyan Machine Shops, Logan, W. Va., machinery dealers, have inquiries out for a heavy duty lathe for turning steel wheels for locomotives, 36 in. diameter and smaller; a 300-hp. steam engine, suitable for driving an electric generator; 125-hp. a.c., induction motor, 2300-volts, three-phase, 60-cycle, to be used with generator, either direct-connected or belt-driven; one 5-hp. motor, 220-volts, three-phase, 60-cycle; hydraulic press for handling wheels, 250 to 300 tons capacity, and one hydraulic press, about 15 tons capacity, for handling armature shafts.

## Gulf States

BIRMINGHAM, Oct. 27.

**W**ORK will begin on a new one-story building at the plant of the United States Cast Iron Pipe & Foundry Co., Anniston, Ala., 50 x 120 ft., estimated to cost \$22,000, for which a general contract has been awarded to Charles F. Duke, Anniston.

The Frost-Johnson Lumber Co., Campti, La., has tentative plans for the rebuilding of the portion of its mill, destroyed by fire, Oct. 16, with loss estimated at \$200,000 with machinery.

W. B. Zachary, city clerk, Sebring, Fla., will take bids until Nov. 10 for equipment for the proposed municipal waterworks, including pumping station and pumping machinery, 100,000-gal. elevated tank and tower and 200,000-gal. collecting reservoir. Paul H. Norcross, Candler Building, Atlanta, Ga., is consulting engineer.

The G. R. Mueller Co., Brown-Marx Building, Birmingham, machinery dealer, has inquiries out for one electric generator, 50 to 75 kw. capacity, a.c., three-phase, 60-cycle, 220 volts; also for one 100 hp. oil engine, with auxiliary equipment.

The Texas Power & Light Co., Dallas, Tex., is arranging a fund of about \$10,000,000 for extensions and im-

provements in its generating plants, substations and transmission lines, to include the installation of considerable additional machinery. C. E. Calder is president.

The Monroe Sand & Gravel Co., Monroe, La., is in the market for a steam shovel, with 2½-yd. dipper, mounted on crawler trucks, suitable for heavy service.

The Riecke Cabinet Works, Inc., 1052 Annunciation Street, New Orleans, has plans for the erection of a new factory, two stories, 160 x 160 ft., estimated to cost \$18,000 exclusive of machinery. It will manufacture store fixtures and other millwork specialties.

Fire, Oct. 21, destroyed a portion of the mill of the W. T. Smith Lumber Co., Chapman, Ala., with loss estimated at \$100,000 including equipment. Plans for rebuilding are under consideration.

H. J. Freeman & Sons, 3638 N. E. Second Avenue, Miami, Fla., are completing plans for a three-story automobile service, repair and garage building in the Buena Vista district, 100 x 110 ft., estimated to cost \$65,000 with equipment.

The Superior Lime & Hydrate Co., Pelham, Ala., is completing arrangements for the construction of an ice-manufacturing plant and will place orders for primary equipment at once. It has work under way on extensions in its lime plant, to include the installation of two additional kilns and auxiliary machinery. H. G. Bridgewater is general manager.

The Common Council, Port Lavaca, Tex., has plans for the installation of a municipal waterworks and will soon ask bids for machinery, including pumping apparatus, tank and tower and accessory equipment. Terrell Bartlett, Calcasieu Building, San Antonio, Tex., engineer, is in charge.

The Marland Refining Co., Ponca City, Okla., has acquired 320 acres at Big Lake, Reagan County, Tex., as a site for a new storage and distributing plant with capacity for handling about 80,000 bbl. of oil. The site will be used in connection with the pipe line of the company and the construction of a central pumping plant.

Plans are being arranged for the organization of a new company at Alexandria, La., capitalized at \$3,000,000, to construct and operate a local pulp and paper mill. The initial unit is estimated to cost approximately \$1,000,000 with machinery. The Alexandria Chamber of Commerce, George C. Merkel, secretary and managers, is interested in the project.

## South Atlantic States

PHILADELPHIA, Oct. 27.

**P**LANs are being completed by the N. & G. Taylor Co., Cumberland, Md., manufacturer of tin andterne roofing, etc., for the erection of a new mill to cost \$30,000 with equipment. Headquarters are at 300 Chestnut Street, Philadelphia.

The Purchasing Agent, Post Office Department, Washington, will take bids until Nov. 10 for three tractors and one electric motor truck, as per specifications.

The Standard Oil Co. of New Jersey, 500 St. Paul Street, Baltimore, is having plans drawn at its general engineering offices, Elizabeth, N. J., for the proposed oil storage and distributing plant at Welch Point, Elkton, Md., estimated to cost \$85,000 with equipment.

The Grove Sand & Stone Co., Asheville, N. C., is in the market for a locomotive crane for standard gage track, or mounted on crawler tractor, to be used with a bucket of about 1 or 1½-yd. capacity. G. C. Buquo is general manager.

The Board of Aldermen, Rocky Mount, N. C., will soon lay foundations for the proposed municipal electric light and power plant, estimated to cost \$110,000 including equipment.

R. K. Moseley, Broxton, Ga., has inquiries out for a 12 to 15 hp. engine and boiler, with accessory apparatus, boiler to be high pressure type, on wheels.

Work will begin on a two-story automobile service, repair and garage building on South Tyron Street, Charlotte, N. C., estimated to cost \$30,000, to be occupied under lease by the Wilson Motor Co., Charlotte. The Palmer-Spivey Construction Co., 404 South Tyron Street, has the general erection contract.

The General Purchasing Officer, Panama Canal, Washington, will take bids until Nov. 14 for mechanical equipment, including drills, taps, bolts, boiler punches, reamers, rivets, core drill, engine lathe, steel rope, pipe fittings, expansion bolts and shells, saws, vises, shovels, truck casters, sledge handles, storage batteries, etc., circular 1627; until Nov. 2, for one 2000-gal. centrifugal sewage pump, and one 2500-gal. similar pump, with accessories, circular 2-1631-14.

The Wilson-Hock Co., City Point, Va., machinery dealer,

has inquiries out for one air compressor, either steam or motor-driven, with capacity of about 500 ft. free air per min.; two steam shovels about 1½-yd. capacity, full revolving, crawler type; one 100 to 150 hp. return tubular boiler, stationary; one 50 to 75 hp. locomotive or Scotch type boiler; one 80-hp. locomotive type boiler; two standard gage, saddle-back locomotives, 18 to 25 tons capacity; one 50 kw. generator, three-phase, 60-cycle, 220 volts, belted to exciter, with switchboard, etc.; one scalping screen, 60-in. x 12 to 15 ft.; two sizing screens, 60 in. x 24 ft.; one portable conveyor for unloading and handling coal, with three-phase, 60-cycle, 220-volt motor; one troughing conveyor, 30 in. wide, 150 ft. centers; 15 all-steel, quarry type cars, about 3-yd. capacity, each, standard gage; one engine, slide valve type, 40 to 50 hp.; several motors, 40, 50, 75, and 150 hp. three-phase, 60-cycle, 440 to 550 volts.

E. C. Seiz, 43½ Peachtree Street, Atlanta, Ga., architect, is completing plans for a new automobile service, repair and garage building estimated to cost \$300,000 with equipment.

The Selma Brick Co., Selma, N. C., is considering the installation of additional equipment at its plant, including a bucket elevator, about 30 ft. high; conveyor belt equipment and other handling machinery. George M. Norwood is vice-president.

The Chief of Engineers, United States Army, Washington, will take bids until Nov. 14 for 10,000 ft. 2-conductor, lead-covered and armored cable, proposal 7; until Nov. 10 for 300 hand fuel pumps, circular CAS-34, for the Air Service Department, United States Army.

Davidson & Kenedy, 872 North Ashby Street, Atlanta, Ga., manufacturers of oil mill machinery and parts, have plans under way for a new two-story factory at Jefferson and Hornady Streets, estimated to cost \$20,000.

The Baltimore Gas Appliance & Mfg. Co., Bayard and Hamburg Streets, Baltimore, manufacturer of gas stoves, water heaters, etc., has completed plans for the purchase of the William M. Crane Co., 18 East Forty-first Street, New York, manufacturer of similar products, with foundry and plant at Jersey City, N. J. The Standard Gas Appliance Co. will be formed to consolidate the two interests. A bond issue of \$800,000 has been arranged, the proceeds to be used for the purchase of the Crane company and for proposed extensions and improvements. George H. Warner, heretofore vice-president of the Crane company, will be president of the new organization and D. H. Schall, formerly connected with the Detroit Stove Works, will be vice-president.

The Crystal Ice Co., 43 North Liberty Street, Asheville, N. C., will build a new ice-manufacturing plant for an initial daily output of 150 tons, estimated to cost \$100,000 with machinery. E. W. Grove is president.

J. Lester Barr & Co., 2700 North Charles Street, Baltimore, engineers, are in the market for one 100 hp. boiler, horizontal return tubular or internal-fired, and one 90 hp. boiler, internal-fired.

The Bureau of Supply, Treasury Department, Washington, will take bids until Nov. 4 for 5800 squares sheet metal roofing; 100 ft. sheet metal combing; quantity of wire nails, etc., circular 1613.

## Indiana

INDIANAPOLIS, Oct. 27.

**W**ORK will soon begin on a four-story and basement branch, 80 x 150 ft., at Senate Avenue and Pratt Street, Indianapolis, for the Standard Sanitary Mfg. Co., Bessemer Building, Pittsburgh, to cost approximately \$200,000 with equipment. The Hunting-Davis Co., Century Building, Pittsburgh, is architect and engineer.

The National Malleable & Steel Castings Co., 500-90 Holmes Street, Indianapolis, has taken out a permit for the erection of a one-story addition to cost about \$65,000.

The Central Glass Co., Hartmetz Building, Evansville, Ind., is having plans drawn by the H. E. Boyle Co., Furniture Building, architect, for rebuilding its one-story mirror and glass works, 100 x 200 ft., at 1900 State Street, recently destroyed by fire. The new plant will cost \$25,000. J. L. Lutt is general manager.

The Calumet Gas & Electric Co., Valparaiso, Ind., is disposing of a bond issue of \$2,500,000, a portion of the proceeds to be used for extensions and additional equipment. Samuel Insull is president.

The Tokheim Oil Tank & Pump Co., Wabash Avenue, Fort Wayne, Ind., has plans under way for a new three-story building to cost about \$50,000. Guy Mahurin, Standard Building, is architect. C. O. Griffin is secretary and treasurer. Bids will be asked at once on a general contract.

The Donato Cut Stone Co., Belford, Ind., is inquiring for a used crane of 3 to 7½ tons capacity.

The Harter Rolled Metal Co., Elkhart, Ind., recently incorporated with \$50,000 capital stock to manufacture metal tubing, metal sections, etc., will occupy part of the Engman-Matthews Range Co. Building, Goshen, Ind., and will employ 75 men.

## Canada

TORONTO, Oct. 27.

**M**ACHINE-TOOL sales in this market during the past week or two, while not showing general improvement, have been maintained at a satisfactory level. Inquiries are confined mostly to small lists with an occasional one for a half-dozen tools. The demand is chiefly for replacement purposes, with many orders for individual tools for garages, automobile repair plants and lumber mills.

The Andrew S. Forman Co., 232 St. James Street, Montreal, is in the market for a 350 kw., 550 volt, 60 cycle, three-phase, generator, direct connected to steam engine, exciter and switchboard; also four 75-hp., slip ring motors.

The Canadian Wire Bound Boxes, Ltd., 1000 Gerrard Street, East, Toronto, is in the market for a complete set of used machinery and tools for grinding 6-in. band re-saws.

Millers' Machinery, Ltd., 44 St. George Street, Montreal, is in the market for a 15 x 16 in. Ideal engine; two boilers, 18 x 72 in., for 150 lb. working pressure.

The Woodstock Electric Co., Woodstock, Ont., is in the market for a 1, 1½ or 2-kw., 60 cycle, 110 volt generator.

The Taylor Electric Mfg. Co., Ltd., 526 Adelaide Street, London, Ont., is asking for a second-hand drawing press, equal to a No. 3½ Bliss.

The Gibson Mfg. Co., Guelph, Ont., is in the market for a second hand No. 3 beading machine, Brown-Boggs; also one No. 2 squaring shear, cornice brake.

J. Young, Lanark, Ont., is erecting a sash and door factory and is in the market for complete equipment.

J. D. Moore & Co., Ltd., St. Mary's, Ont., will purchase additional refrigerating machinery for a local plant.

The West End Garage Co., Peterboro, Ont., is in the market for a lathe and drill press, etc. A. T. Fontaine is purchasing agent.

Belle River, Ont., will build a pump house in which two electric pumps will be installed.

J. H. Queh, Shakespeare, Ont., will purchase machinery and tools for a furniture factory.

According to W. R. Campbell, vice-president Ford Motor Co. of Canada, Ltd., the company will reopen its London, Ont., plant for the manufacture of accessories, such as lamps and electrical equipment. While it does not contemplate building a new plant at London, it is stated that alterations and improvements will be made to the present works there.

Sault Ste. Marie, Ont., proposes to install a gasoline unit to be used as an auxiliary pump at the local waterworks plant. R. G. Campbell is clerk.

J. J. Fitzpatrick, 127 Church Street, Toronto, has the general contract for a machine shop and airdrome at Sault Ste. Marie, Ont., to cost \$100,000. The Sarnia Bridge Co. has been awarded contract for reinforcing steel and additional contracts will be awarded later.

The Dominion Envelope & Carton Co., Ltd., Toronto, is having plans prepared by W. F. Sparling & Co., for addition to its factory, for which bids will be called next month.

Wheeler & Bain, Ltd., George Street, Toronto, manufacturer of furnaces, fireproof doors, galvanized roofing, etc., will build an addition to its factory.

A company has been formed at Windsor, Ont., of which E. G. Watford, 150 Sandwich Street West, Windsor, Ont., is manager, for the erection of an artificial ice arena, for which refrigerating equipment will be required.

It is officially announced that the Horton Steel Works, Ltd., 106 Janet Street, Bridgeburg, Ont., has purchased the physical property, plant and good will of the Canadian Des Moines Steel Co.

Construction will start at an early date on an electric pump house at Belle River, Ont., for the Canadian National and Wabash railroads. Two large electric pumps will be installed.

It is reported that John Lysaght, Ltd., Bristol and Newport, England, manufacturer of galvanized sheets, which recently acquired an interest in the Dominion Sheet Metal Corporation, Ltd., Hamilton, Ont., has completed plans for the establishment of a galvanizing plant in Montreal.

The Hoover Suction Sweeper Co., Hamilton, Ont., has



prepared a building program for additions to its plant, for which a considerable amount of machinery and tools will be purchased.

The Horton Steel Works, Ltd., Bridgeburg, Ont., will purchase a rotary planer with 36-in. to 48-in. head.

#### Western Canada

Smith Brothers & Wilson have started work on the erection of a factory for the B. C. Valve Co., Ltd., Vancouver, B. C., to cost \$21,000.

### Pacific Coast

SAN FRANCISCO, Oct. 22.

**P**RELIMINARY plans are being developed by the Board of City Trustees, Anaheim, Cal., for the proposed municipal steam-operated electric generating plant, for which a bond issue of \$240,000 will be used.

The Quality Enameling & Porcelaining Co., 1643 Howard Street, San Francisco, has tentative plans for a one-story factory, 150 x 180 ft., for the production of enameled iron and kindred specialties estimated to cost \$30,000.

The Northwestern Electric Co., Portland, will begin the construction of a power dam on the North Fork of the Lewis River, near Amboy, Wash., for hydro-electric development. The dam will be 140 ft. high and 490 ft. long. The proposed generating plant will have an initial installation of two 15,000-kw. turbine units with auxiliary machinery, to be increased by another unit of like size in the future. The entire project is estimated to involve \$4,000,000.

The Union Ice Co., San Diego, Cal., will erect two new ice-manufacturing plants, one at East San Diego and the other at La Jolla, near San Diego, estimated to cost \$110,000 with equipment. It is also considering the erection of three additional plants on the San Diego waterfront and at National City and Ramona.

The Los Angeles Gas & Electric Corporation, Los Angeles, has arranged a bond issue of \$6,000,000, a portion of the proceeds to be used for extensions and improvements.

The Diamond Patent Show Case Co., Inc., 1625 Mission Street, San Francisco, has awarded a general contract to the F. R. Siegrist Co., 604 Williams Building, for its proposed one-story plant estimated to cost \$45,000.

H. H. Meyers, Kohl Building, San Francisco, architect, has plans for a three-story and basement automobile service, repair and garage building on East Embarcadero Street, estimated to cost \$135,000 with equipment.

The Boeing Airplane Co., 330 West Front Street, Seattle, has awarded a general contract to the Austin Co. for a one-story addition to its plant, 50 x 200 ft., estimated to cost \$25,000. Bebb & Gould, Hoge Building, are architects.

The Pacific Gas & Electric Co., 445 Sutter Street, San Francisco, will begin excavations for its proposed electrical repair and construction works at Emeryville, Cal., including machine, electrical and metal-working shops, estimated to cost \$500,000 with equipment.

The Lennox-Wallace Co., 7275 Fountain Avenue, Los Angeles, has been incorporated with capital stock of \$500,000 to manufacture gas and oil separators and oil well specialties. Manufacturing at first will be done by contract, but the company plans to build a factory and will be in the market for equipment. Talbot Lennox, president, was previously connected for 11 years with the college at Ames, Iowa, as instructor in mechanical engineering.

The C. F. Bulotti Machinery Co., 67-71 Main Street, San Francisco, is in the market for a 300-ton hydraulic wheel press for 72-in. car wheels, also for a 60 x 60 x 12 ft. open-side planer.

C. A. Miller and E. F. Gilbert, 407 Merritt Building, Los Angeles, have leased a site at Sixth and Carondelet Street, for the erection of a nine-story and basement automobile service, repair and garage building, 100 x 134 ft., estimated to cost \$400,000. A general building contract has been awarded to Trewitt & Shields, Western Mutual Life Building.

C. S. Newhall and D. J. McLaughlin, receivers in equity for the Cyclops Steel Co., Pershing Square, New York, have completed their investigation of the company's affairs and announce that business will be continued on the same general lines as before. Operating personnel will not be changed. The mill and foundry at Titusville, Crawford County, Pa., are running at a satisfactory capacity and will be continued.

### Trade Changes

Fred Barker, Jr., formerly with the J. H. Williams Co., has become associated with A. L. Whittemore, Chicago, and will take an active part in the development of the accounts which are handled by the Whittemore Co. in the Chicago territory, namely, the Ferry Cap & Set Screw Co., Cleveland, the Vichek Tool Co., Cleveland, and the Cushman Chuck Co., Hartford, Conn.

The Kewanee Boiler Co., Inc., Kewanee, Mich., has opened a Boston office at 80 Boylston Street, Room 555. Raymond Newcomb is manager.

The Northwest Engineering Co., 28 East Jackson Boulevard, Chicago, has made arrangements in the Pittsburgh territory, whereby the Beckwith Machinery Co., 500 Arch Street, Pittsburgh, will handle its products. An office has been established under the direction of W. W. Mutter, at 23 Main Street, San Francisco. The Collins-Kay Co., Los Angeles, Cal., also will handle Northwest equipment.

Effective Nov. 1, the John C. Brill Co., 610 United Fruit Co. Building, New Orleans, will handle the products of Bliss & Laughlin, Inc., Harvey, Ill., in the South. The Brill Co. will cover western Tennessee, Alabama, Mississippi, Louisiana, Texas and Arkansas. Bliss & Laughlin are makers of turned shafting, cold drawn and cold rolled rounds, flats, squares, hexagons and shapes.

Agnew, Battelger & Co., Philadelphia, has changed its address from Room 1642 to Room 1630 Widener Building.

The Detroit Electric Furnace Co., Detroit, has changed its address to 2331 First National Bank Building.

The Petroleum Iron Works Co., Sharon, Pa., is receiving sales letters addressed to the general manager, Pressed Steel Products Co., Sharon, Pa. Several years ago this company was absorbed by the Iron Works company and now is known as its pressed steel products department.

Charles E. Moore, vice-president and secretary Herberts Machinery & Supply Co., formerly at the main office of the company in Los Angeles, Cal., is now in charge of the San Francisco office at 140 First Street. B. J. Flanagan, formerly San Francisco branch manager, will open a machine tool establishment at Oakland, Cal.

The John F. Folkers Engineering Corporation, Mobile, Ala., has been appointed agent to handle sales and service for the Triumph Electric Co., builder of motors, Cincinnati, in the Mobile territory.

The name of the Sandusky Foundry & Machine Co., Sandusky, Ohio, has been changed to the Paper & Textile Machinery Co. No change in ownership, management or policies has been made.

The W. T. McFie Supply Co. announces as representative of the Sharon Steel Hoop Co. that a stock of hoop steel is now carried at its warehouse at Los Angeles, Cal.

The Chemical Engineering & Foundry Co., Atlanta, Ga., announces the removal of its New York sales office from Room 1042, 70 East Forty-fifth Street, to its own quarters, Room 913, 52 Vanderbilt Avenue, at Forty-fifth Street. Robert S. Beecher is sales manager.

### Industrial Notes

The Cleveland Worm & Gear Co., manufacturer of worm gearing for automotive purposes and worm gear speed reducers for industrial use, is moving into its new plant on East Eightieth Street, south of Kinsman Avenue, Cleveland. The first unit has been erected at a cost of approximately \$200,000, is of one-story construction, monitor type, and will have a total floor area of 45,000 sq. ft. In developing its product, the company has found it necessary to build special machinery for hobbing worms and generating gears. In addition to these machines the new plant will be equipped with modern machinery throughout.

The Newark Wire Cloth Co., Newark, N. J., has established a new branch office in New England at 66 Hamilton Street, Cambridge, Mass., with John G. Loring in charge. A new factory of over 30,000 sq. ft. ground area has just been completed on Verona Avenue, Newark. The company manufactures all varieties of wire cloth from a 4-in. space heavy wire to fine meshes of 325 wires per sq. in.

Real estate, machinery and equipment of the Nagle Steel Co., Seyfert, Pa., will be sold at auction on Nov. 13, at 11 a. m., on the premises. Real estate comprises a rolling mill and about nine acres of ground and railroad siding; also 17 dwellings to be sold separately. Machinery and equipment, which will be sold in separate lots only, consist of two rolling mills, three large shears, punch presses, machine tools, small tools, furnaces, a large lot of scrap, etc. Samuel T. Freeman & Co., 1503-16 Chestnut Street, Philadelphia, and 80 Federal Street, Boston, are the auctioneers.

# Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of items the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE, under the general heading of "Iron and Steel Markets" and "Non-Ferrous Metals."

Bars, Shapes and Plates	
	Per Lb.
Refined iron bars, base price.....	3.24c.
Swedish charcoal iron bars, base.....	6.75c. to 7.25c.
Soft steel bars, base price.....	3.24c.
Hoops, base price.....	4.49c.
Bands, base price.....	3.99c.
Beams and channels, angles and tees, 3 in. x ¼ in. and larger, base.....	3.34c.
Channels, angles and tees under 3 in. x ¼ in., base.....	3.24c.
Steel plates, ¼ in. and heavier.....	3.34c.

Merchant Steel	
	Per Lb.
Tire, 1½ x ½ in. and larger.....	3.20c.
(Smooth finish, 1 to 2½ x ¼ in. and larger) ..	3.55c.
Toe-calk, ½ x ¾ in. and larger.....	4.20c.
Cold-rolled strip, soft and quarter hard.....	7.00c.
Open-hearth spring steel.....	4.50c. to 7.00c.
Shafting and Screw Stock:	
Rounds.....	4.05c.
Square, flats and hex.....	4.55c.
Standard tool steel, base price.....	15.00c.
Extra tool steel.....	18.00c.
Special tool steel.....	23.00c.
High-speed steel, 18 per cent tungsten.....	70c.

Sheets	
Blue Annealed	
	Per Lb.
No. 10.....	3.89c.
No. 12.....	3.94c.
No. 14.....	3.99c.
No. 16.....	4.09c.

Box Annealed—Black	
	Per Lb.
Nos. 18 to 20.....	4.30c. to 4.45c.
Nos. 22 and 24.....	4.45c. to 4.60c.
No. 26.....	4.50c. to 4.65c.
No. 28*.....	4.60c. to 4.75c.
No. 30.....	4.70c. to 4.95c.

Galvanized	
	Per Lb.
No. 14.....	4.70c. to 4.85c.
No. 16.....	4.85c. to 5.00c.
Nos. 18 and 20.....	5.00c. to 5.15c.
Nos. 22 and 24.....	5.15c. to 5.30c.
No. 26.....	5.30c. to 5.45c.
No. 28*.....	5.60c. to 5.75c.
No. 30.....	6.10c. to 6.25c.

\*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

Standard Steel	
Black	Galv.
½ in. Butt... —41	—24
¾ in. Butt... —46	—32
1-3 in. Butt... —48	—34
2½-6 in. Lap... —44	—30
7-8 in. Lap... —41	—11
9-12 in. Lap... —34	—6

Wrought Iron	
Black	Galv.
½ in. Butt... —4	+19
¾ in. Butt... —11	+9
1-1½ in. Butt... —14	+6
2 in. Lap... —5	+14
2½-6 in. Lap... —9	+9
7-12 in. Lap... —3	+16

Bolts and Screws	
Machine bolts, cut thread,	50 to 50 and 10 per cent off list
Carriage bolts, cut thread,	40 to 40, 10 and 10 per cent off list
Coach screws, 50 to 60 per cent off list	
Wood screws, flat head iron,	75, 20, 10 and 10 per cent off list

Steel Wire	
	Per Lb.
Bright, basic.....	4.25c. to 4.50c.
Annealed soft.....	4.50c. to 4.75c.
Galvanized annealed.....	5.15c. to 5.40c.
Coppered basic.....	5.15c. to 5.40c.
Tinned soft Bessemer.....	6.15c. to 6.40c.

\*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire	
BASE PRICE	
High brass sheet.....	17½c. to 18½c.
High brass wire.....	17½c. to 18½c.
Brass rods.....	14½c. to 15½c.
Brass tube, brazed.....	25½c. to 25½c.
Brass tube, seamless.....	21½c. to 22½c.
Copper tube, seamless.....	22½c. to 23½c.

Copper Sheets	
Sheet copper, hot rolled, 20½c. to 20½c. per lb. base.	
Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.	

Tin Plates	
	Coke—14 x 20
Bright Tin	
Grade "AAA"	Grade "A"
Charcoal 14x20	Charcoal 14x20
IC..\$11.25	\$8.85
IX.. 12.85	10.85
IXX.. 14.40	12.55
IXXX.. 15.75	13.85
IXXXX.. 17.00	15.05

Terne Plates	
	8 lb. coating, 14 x 20
100 lb.....	\$7.00 to \$8.00
IC.....	7.25 to 8.25
IX.....	8.25 to 8.75
Fire door stock.....	9.00 to 10.00

Tin	
Straits, pig.....	54c.
Bar.....	58c. to 62c.

Copper	
Lake ingot.....	16 c.
Electrolytic.....	15½c.
Casting.....	14½c.

Spelter and Sheet Zinc	
Western Spelter.....	7½c.
Sheet zinc, No. 9 base, casks.....	10.85c. open 11.60c.

Lead and Solder*	
American pig lead.....	9½c. to 10c.
Bar lead.....	12c. to 13c.
Solder, ½ and ½ guaranteed.....	39c.
No. 1 solder.....	36c.
Refined solder.....	30½c.

\*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal	
Best grade, per lb.....	75c. to 90c.
Commercial grade, per lb.....	35c. to 50c.
Grade D, per lb.....	25c. to 35c.

Antimony	
Asiatic.....	13½c. to 14½c.

Aluminum	
No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.....	36c.

Old Metals

The market continues strong and business is improved. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible.....	11.25
Copper, heavy wire.....	10.75
Copper, light bottoms.....	9.25
Brass, heavy.....	6.75
Brass, light.....	5.25
Heavy machine composition.....	8.00
No. 1 yellow brass turnings.....	7.50
No. 1 red brass or composition turnings.....	7.50
Lead, heavy.....	7.25
Lead, tea.....	5.25
Zinc.....	3.75
Cast aluminum.....	16.00
Sheet aluminum.....	16.00